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Original Lectures.

THE SURGICAL CLINIC.

EXTRACTS FROM PROF. SHEAR'S CLINIC IN THE HAHNEMANN MEDICAL COLLEGE AND HOSPITAL OF CHICAGO.

TRAUMATIC EPILEPSY; REMOVAL OF A FOREIGN BODY FROM THE BRAIN.—*Case.* This young man, aged twenty-one years, comes to our clinic from Dr. Bothwell, of Batavia, to see whether anything can be done for the relief of epileptic attacks which he attributes to an injury received from the bursting of a gun. Three years ago a gun exploded in his hands and the breech pin struck him in the forehead at the inner angle of the right orbit. This piece of metal was forced into the forehead for its entire length, the physician in attendance being just able to grasp it with the forceps. The piece was withdrawn, the wound cleansed and a dressing applied. Healing was rapid and uneventful. You notice the depression of the inner extremity of the supra-orbital ridge and the scar extending to the nose and forehead. Last summer, some two years after the accident, the patient had an epileptic attack, and he has had a number since that time. The attacks are preceded by dizziness lasting from a few minutes to an hour. Neither the patient nor his friends are able to say whether the attacks are always preceded by twitchings of any particular muscle or any definite part of the body or whether there are any localizing symptoms. The patient is the picture of health, and the attacks cannot come from any reflex disturbance of the digestive or the genito-urinary organs. In the absence of any localizing symptoms and with no evidence of any disease in any other part of

the body, I am led to believe that the convulsions must be due to some irritation at the point of injury, such as an exostosis, a depressed bone or a foreign body.

Operation. I shall uncover the bone by a T-shaped incision, reflecting the flaps and exposing the supra-orbital ridge, the roof of the nose and the upper wall of the orbit. As I do this you notice that the frontal sinus is opened and a communication made with the nasal cavity. At the angle of the orbit the inner plate is deficient, and removal of the fibrous tissue gives us entrance into the cranial

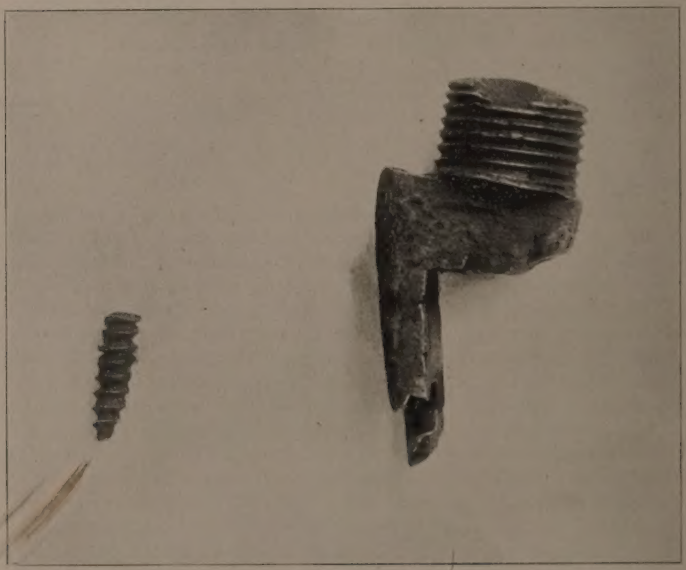

FIG. 15.

cavity. We find no roughness of the inner plate of bone, no loose pieces of bone nor exostoses. The bone, however, shows signs of inflammation near the middle of the orbital ridge. I will enlarge the incision outward with the cutting forceps and examine further. Here is a dark spot in the bone, evidently metal, and as I run my smooth elevator between the dura mater and the cranium I find the dura adherent to the bone. There must be a foreign

body imbedded in the bone and penetrating the brain. With the chisel I cut around the metal and loosen it, then carefully divide the adheions of the dura and extract what proves to be a portion of a screw. (See Fig. 15.) It is evidently the screw that held the wood to the breech. The head was carried off with the wood and the body of the screw was carried into the brain with the breech-pin, but was detached and left in the brain when the pin was withdrawn. As the dura is not attached to the cranium at any other point I presume this is the only foreign body left, and its presence certainly might produce sufficient irritation to result in convulsions. It is interesting to note that it took two years of irritation to produce the convulsions, and also that the convulsions are not due to any septic condition around the foreign body, or even to any accumulation of serum, but entirely to the simple inflammatory adhesions or to degenerative changes in the nerve cells. I cannot promise this patient that he will have no more convulsions. Such trophic changes may have taken place that no regeneration of tissue is possible, but it is evident that his chances for recovery are much better than if a constantly exciting cause were allowed to remain. I will cleanse the wound carefully and drain it thoroughly. Drainage is not often necessary in cranial wounds when direct pressure can be obtained, because all cavities can be obliterated and no room left for the accumulation of secretions, but in this case the frontal sinus is open and communicates with the nasal cavity and I am not certain that absolute asepsis can be maintained if any secretions collect. Septic phlebitis may be directly propagated from the nasal and frontal veins to the longitudinal sinus and serious results follow.

I cannot dismiss this case without calling your attention to the desirability of thorough examination in all cranial injuries. In an article before the World's Congress, 1893, I said: "It may have been wisdom before the time of aseptic and antiseptic surgery, to treat all cases of cranial fracture where there were no brain symptoms, by expectant methods, but with our present methods and basing my conclusions upon the excellent results obtained in my own practice, I feel it my duty to urge thorough examination, using the trephine if necessary, in all cases of fracture of the cranium attended with depression, and in all cases

of compound fracture whether attended with depression or not."

To this may be added that in all penetrating cranial wounds, thorough uncovering of the seat of fracture, trephining and examining of the inner plate and the brain substance should be made. The operation if properly made, is without danger, and the patient may be saved from the possibilities of septic infection and death or the long train of secondary effects, such as cephalalgia, paralysis, insanity, epilepsy and similar troubles. It was only last week that I was called out of town to see a man who, one week before, had been struck on the forehead by a stick thrown from a revolving saw, resulting in a compound fracture of the frontal bone. The wound had been treated expectantly and for five days the patient had done well, being able to get about, having no fever, with clean tongue and good appetite. On the fifth day he had a chill, on the sixth, another, and when I saw him on the seventh day, he was comatose with tongue as dry as a bone; pulse 140, temperature 104°, and every symptom of septic infection. The wound was opened, the loose pieces of bone removed, and several intracranial pus pockets discovered. The wound had evidently been infected from the nasal and frontal sinuses which had been opened and the discharges from which had been dammed up by the depressed bone and by the swelling of the soft tissues. The patient never recovered consciousness, the operation having been made too late. The fact that he did well for five days and that no bad symptoms appeared until pus formed, are evidences to my mind, that had he been anæsthetized at the time of the accident, the wound enlarged, all fragments of bone removed and perfect drainage established, recovery would have been prompt.

It is remarkable how much damage may be done to the frontal or the parietal bones or even the amount of laceration of brain tissue that may take place and yet how uneventful may be the recovery if only all irritating points be removed and the wound be maintained in an aseptic con-

dition. Do not allow yourselves, in deciding upon your line of treatment, to be guided by statistics of the preantiseptic period. They are absolutely worthless and the decisions of the older text-books, based upon these statistics, are equally unreliable as a guide.

(This young man returned to his home in two weeks, having made a good recovery and having had no convulsions during the interval.)

A SECOND OPERATION FOR APPENDICITIS.—*Case.* Five months ago this man, aged thirty-one, was operated upon in one of the suburban hospitals for appendicitis. He does not know whether the appendix was removed or not, but he has had considerable pain ever since the operation. Ten days ago he began to have severe pain in the region of the appendix and he has felt sick ever since, but has not been confined to his bed; indeed he walked into the hospital last evening. He had a temperature last night of 102° and a pulse of 105. Examination shows that the abdomen is sensitive to pressure in the region of the appendix, is dull on percussion in the right iliac region and that there is pronounced rigidity of the right rectus muscle. There is also noticeable a slight prominence of the abdomen on the right side. The rise of temperature, the dullness on percussion and the slight tumor are all evidences to me of the presence of circumscribed pus, which must be evacuated.

I will make my incision over the most prominent part of the tumor, which in this case is a little outside of McBurney's point. You notice that the cellular tissue is œdematous. This is an indication that the incision is in inflamed tissue and that the abscess wall is probably adherent to the abdominal parietes. We must proceed cautiously, for an intestine may be adherent to the parietal peritoneum. Instead of opening into the abscess you see I have opened into the peritoneal cavity, and careful examination shows the abscess adherent to the abdominal wall just outside of my incision. I can easily open into it, but before I do so, for fear that the pus might infect the general peritoneal cavity, I turn the patient on his right

side and wall off the general cavity with this layer of gauze. Now I open the abscess and there escapes, as you are made aware by the sense of smell, a pus most foul in character. I feel carefully in this pus cavity for the appendix but do not recognize it. It may have been imperfectly removed on the former occasion, or it may have been destroyed by suppuration. At any rate it would be foolish for me to risk infecting the general peritoneal cavity which we have so effectually walled off by any extended search. I shall therefore simply drain the abscess cavity, leaving a protecting wall of iodoform gauze on the left side, between the abscess sac and the parietal wall. In forty-eight hours there will be adhesions between the sac wall and the parietal wall, completely shutting off the general peritoneal cavity, and making this abscess practically an external one and but little more dangerous than one in any other soft structures. The external wound must not be allowed to close until it has healed from the bottom. Fortunately with the exit of the pus the abscess cavity is made very small by the intra-abdominal pressure and soon contracts and closes. The question arises as to what shall be done in these cases in which local symptoms recur after drainage of the appendicital abscess. In all such cases I believe a second operation should be undertaken for the removal of the appendix, for my experience shows that, as in this case, serious and often fatal attacks may occur after such operations. The operation should be made before the second attack has occurred for, as in this case, the appendix cannot always be removed if pus has formed. The operation, if undertaken before an attack, is not a serious one, and the patient is relieved of pain, disability and the danger of a second and possibly fatal attack. (This patient made an uneventful recovery.)

GONORRHŒAL CYSTITIS: CYSTOTOMY. *Case.*—Two years ago this patient had gonorrhœa of which he believed himself cured. One year ago he had a chill followed by fever and frequent desire to urinate. Since that time the chills have been of frequent occurrence, until now for some time

past, they have come regularly every third day. At the time of the chill the temperature reaches 104° and the pulse 120. During the chill the urine passes involuntarily but during the fever he is unable to pass it at all. He is losing flesh and strength rapidly. Various opinions have been given regarding the cause of the chills, several physicians, on account of the regularity of the attack, having attributed them to malaria. His present physician, Dr. Hicks, believes them to be due to septic infection of the bladder, and he has washed out that organ, but without perceptible effect. I am convinced, however, that septic inflammation of the bladder, probably of gonorrhœal origin, is the cause of his trouble. The disease is rapidly progressing and unless promptly arrested may result in renal inflammation, suppuration or even death.

I have washed out this bladder and found pus in abundance. I look upon it as simply an abscess cavity and I shall treat it as I would an abscess cavity in any other portion of the body, namely, by drainage thoroughly from the most pendent portion which in this case is through the perineum. Having thoroughly washed out the bladder, I make an internal urethrotomy dividing the strictures, and then introducing the guide, open the bladder freely through the perineal region, being careful to cut deeply through the prostate in order that drainage may be perfect. A large metal drainage tube is introduced. Through this and the urethra the bladder will be irrigated, first with a 1 to 2,000 bichloride solution, followed by sterile water and subsequently by permanganate of potash. The wound will be kept open until the urine is devoid of pus and is otherwise normal in character. The urethra will be dilated every three days.

(The patient had no chills after the operation and made a good recovery in four weeks.)

ON REAL AND APPARENT DEATH.

A LECTURE DELIVERED FEBRUARY 25, 1897, BY C. F. BARKER, M. D., AT THE HAHNEMANN MEDICAL COLLEGE AND HOSPITAL, CHICAGO.

Having now considered some of the emergencies often accompanied with loss of consciousness, including such familiar conditions as concussion of the brain, asphyxia, shock and allied states, we have recalled the main diagnostic features and the treatment of each, assuming that recovery will follow. But suppose no improvement sets in, then all the abnormal phenomena become more and more pronounced, and death terminates the scene.

We must assume, I suppose, that occasionally one of your patients will die. You spend a great deal of time studying the phenomena of health; you spend more in studying those of disease; you need also to be familiar with what constitutes death.

In approaching this topic you will not for a moment expect me to explain its mysteries. We are to deal only with some of the facts pertaining to the dissolution of the body. The death which the physiologist describes is simply physiological dissolution. "Some organs necessary to life are no longer able to perform their functions." Possibly this sort of death comes from a gradual failure of the general process of nutrition. Like the passing of the "One Horse Shay" a purely physiological death is largely a matter of the imagination, and is as rarely witnessed as is a purely physiological life.

To use the words of a well-known author, the difference between life and death may be defined as follows: "Science regards man as an aggregation of atoms temporarily united by a mysterious force called the *life principle*. To the materialist the only difference between a living and a dead body is that in the one case that force is active, in the other latent. When it is extinct or entirely latent the molecules obey a superior attraction which draws them asunder and scatters them through space."

The theologian regards death as the severing of the tie which binds soul and body together.

It is not necessary, however interesting it may be, to add other theories. Practically, the extinction of the life principle comes in many ways. It may be instantaneous, as when a force like dynamite or electricity is applied. It

may be more gradual when some organs or tissues necessary to life are injured, or through disease break down and decay. Death in fact is caused by a multitude of conditions, morbid, or otherwise, and the human body is kept alive only by the most delicate adjustment of all its complicated parts. The more you study in your chosen profession the better you will understand in how frail a structure we live, and how very vulnerable we are at all points.

Man needs only to be a little too hot or a little too cold, and the vital principle departs. He spills a little too much of that important fluid, the blood, and the light goes out. Possibly an important nerve centre is injured or diseased, an excretory organ is deranged, the heart fails to do its work, the air cannot enter the lungs—a blow on the head, a violent emotion, a little of the wrong drug—these, and hundreds of simple and complex conditions lie in wait to render his habitation unfit for use, and then *death* is the word we use to tell what happens.

Now, how can we know that death has taken place—how determine in a given case that the functions of life are forever still?

The following are the proofs of death usually given. They are more or less certain and are of considerable value in doubtful cases.

1. *The breathing ceases.* The movements of the chest can no longer be demonstrated, no moisture collects upon a mirror or polished surface held over the mouth, the surface of a glass of water or of quicksilver set upon the chest is not disturbed.

2. *The heart's action stops.* No evidence of the heart action or pulse can be detected. If a moderately tight ligature be placed about a finger, the part beyond the ligature does not swell.

3. *The red color disappears in parts that are translucent.* During life a strong light held on either side the open hand or of the ear produces a red glow in the tissues if viewed from the side opposite the light. The reddish glow is absent in the dead.

4. *The temperature of the body falls much below normal.* The surface is cold and in a few hours the body is not warmer than the surrounding atmosphere.

5. "*All of the muscles lose their faradic contractility.* Muscular death does not correspond with general death of the body, but follows the latter at a period varying from thirty minutes to several hours." (Rosenthal).

The same scientist finds that *post-mortem* electro-excitability disappears more rapidly when death follows chronic diseases than after acute maladies, and that contractions can be produced longer in bodies that are well nourished than in those that are emaciated.

Authors do not quite agree upon the time that elapses after death before all the muscles are insensible to electrical stimulus. It may be roughly estimated as from one to five hours, the muscles about the face losing their electro-excitability first and those of the abdomen retaining it longest.

6. *Rigor mortis sets in, usually in from five to seven hours, and lasts from twenty-four to thirty-six hours.* In persons killed suddenly, this muscular rigidity may not develop for twenty-four hours or longer. In death resulting from chronic diseases it may appear a few minutes after life is extinct.

7. *If a bright steel needle be thrust deeply into the flesh and left in place it will become tarnished and rusty.* In living tissues the needle remains bright.

8. The pupils of the eyes are dilated, the cornea dull and glazed, and extract of calabar bean instilled into the eyes will not contract the pupils.

9. *Decomposition sets in.* This is the most important indication of all. The others may leave us in doubt, but this can be depended upon. Decomposition usually begins to appear when *rigor mortis* disappears, but not unless the body has been kept under ordinary conditions of heat and moisture. Packing the body in ice, of course, prevents its appearance. Its presence is denoted both by the odor and by a greenish discoloration most noticeable about the abdomen.

It has recently been stated from authoritative sources that by the aid of the X-rays a positive conclusion may be reached in the matter of determining death, as the flesh of the dead is said to offer more resistance to the passage of these rays than the flesh of the living. This statement may need further testimony.

Once a man has entered upon the practice of medicine or surgery he is likely at any time to have to decide whether some person is dead or not. In the vast majority of deaths special or extraordinary tests, are not needed. Most acute and chronic diseases which result in death carry with them unmistakable evidences that their work is done.

There is occasionally a case, however, about which one

cannot be so sure, and this brings us to the consideration of that peculiar condition known as

Suspended animation, or apparent death. Cases are occasionally, though not often encountered, where life is not extinct, and yet the subject has all the appearances of being dead. In such cases none of the above tests, excepting the ninth, are of positive value. But putrefaction itself may be long delayed, especially in subjects addicted to the use of certain drugs, as alcohol or arsenic, or in persons poisoned by these or by other antiseptic drugs.

When death suddenly occurs in persons subject to peculiar nervous conditions the closest scrutiny by the medical attendant is demanded, for it is asserted on very good authority that instances of suspended animation in such persons are not at all rare. It is even claimed that at least one case per week is about the average of those discovered and reported in the United States alone. Certainly this is not a large estimate if we accept the newspaper accounts. Some of these cases have been investigated by competent persons and are known to be genuine. It is not impossible that a few may remain undiscovered and unreported.

To the unique condition known as catalepsy most apparent deaths are supposed to be due. The occasional, though generally unfounded, report that some one has been buried alive, or has been mistakenly pronounced dead by physicians, has put fear into the minds of many good people. An individual who might view death itself with perfect equanimity would ordinarily be appalled at the idea of premature burial. To provide against such a possible fate, clauses are inserted in wills or promises are secured from friends to the end that, by one means or another, it shall be positively ascertained that death has occurred before interment is permitted. The growing popularity of cremation is believed to be due in part to the fear of premature burial.

Let us examine for a moment some of the facts that appear to weaken the value of some of the usual tests for death. Indian fakirs have repeatedly proved their ability to exist without respiration, not only for weeks but for months. In these cases the most delicate tests fail to demonstrate that the heart is acting. With nostrils and ears plugged with wax, and the tongue thrust back into the throat so as to close the glottis, the body tied securely into a linen bag and placed in a tight box, solidly closed,

and then buried several feet under ground to be left weeks or months, how is it possible for respiration and circulation to go on?

Rigor mortis is not always a positive test, since the muscular rigidity of catalepsy has been mistaken for it. Also according to Bernheim electro-contractility is abolished in certain subjects under hypnosis. It is said, moreover, that the eyes of the fakir, when he is exhumed, are in no way different in appearance from the eyes of one dead, and that extract of calabar bean does not affect the size of the pupil. The value of the needle test has been questioned by some. Evidently we must regard decomposition as the one sure test if ever we are in serious doubt.

It is, however, very uncommon for a physician to be obliged to wait for signs of putrefaction before he speaks decisively, and it is my wish to emphasize this fact and at the same time to warn you against hasty conclusions both in cases of sudden death and when death follows long periods of nervous exhaustion.

Please remember that the persons most likely to furnish material for suspended animation are believed to be those who have manifested tendencies to psychic conditions known as trance, catalepsy, hypnosis, hysteria, etc,, etc., and these will demand your best powers of observation should you ever encounter apparent death in them.

When one is called upon to decide a question in this field, the situation will not always be as humorous as that described by Mark Twain, who, when his guide conducts him into the presence of an Egyptian mummy 3,000 years old, suddenly and gravely asks "Is he dead?" If your reply is slower in coming, I trust it will not be less accurate than must have been that of the guide.

In the early years of a physician's practice doubts probably come oftenest. We certainly remember our own experiences best, and a case of my own illustrates the anxiety which all of you may some time experience.

Called suddenly from bed one night I was conducted to a house in the neighborhood to see if a man was dead. It was an attack of cholera morbus, so his roommate thought. In one of his enforced visits to the bath room the sick man was unable to proceed and had seated himself upon a water jar near the bed and had there remained. After a time, the roommate, who was a working man and very sleepy at night, noticed him sitting there and that he did not

reply when addressed. Further investigation showed that he was unconscious and apparently getting cold and stiff.

These men were strangers to me, and the man who called me could give no very good idea of his friend's previous physical condition or tendencies—"supposed him to be well when he retired." Both had drank liquor the evening before. As I viewed him, the man sat upon the jar as naturally as if alive, one arm resting upon the arm of a chair and his eyes partially open.

At such times one will search for the pulse and the movements of the heart and signs of respiration, and the imagination will help to delude. One's own pulse in the fingers tips will make one believe that his patient has a very active circulation. If you sit and gaze at the motionless chest for awhile you will begin to see it rise and fall quite regularly, but you suspect all the while that it does not.

With regard to this particular case, being newly settled in that locality I felt that my reputation was somewhat at stake. It is very natural for a new physician to desire to know whether he is about to establish relations with a possible patient or with a cadaver.

In the cases of apparent death exhibited by East Indian fakirs, it seems to me we have a type of suspended animation that shows human possibilities in this direction. Those who deny the genuineness of such exhibitions have simply not acquainted themselves with the mass of facts pertaining to this subject. Scores of such cases are recorded, and hundreds of competent witnesses attest to the truth of the records and declare that the test conditions were of the most rigid sort. In some instances the bodies were exhumed at intervals of weeks or months, and then re-interred in order to prevent fraud and to satisfy skeptical witnesses. A guard of English soldiers was kept constantly on duty about some of these graves.

In all cases when the bodies were disinterred they were found in the same state as when buried—legs and arms shriveled and stiff, and every appearance corpselike. Absolutely no signs of pulse or respiration were present. Some observers noticed a slight warmth over the occipital portion of the brain.

Since it is true that naturalists as well as ordinary backwoodsmen have always had in what is known as the hibernation of certain animals, reptiles and insects, a perfectly natural process analagous to this artificial one, there

is nothing in the experiments of the East Indian fakirs to very much surprise any reasoning individual.*

The study of hypnotism has shed much light upon the phenomena of suspended animation. It is now known that persons in good health can voluntarily enter a state of catalepsy. One notable case was a man who could not only voluntarily become cataleptic, but who had repeatedly convinced physicians that he was dead, although he had invited them to witness his performance, not expecting to more than astonish them.

Many cases of catalepsy have been recorded where the subjects remained apparently dead for days. When finally restored some have attested that they were conscious all the time, and, though unable to move or to speak, remembered all that occurred about them. Like persons hypnotized, they were unable to reason and so were indifferent to results.

In Hudson's "Law of Psychic Phenomena" is an interesting chapter on suspended animation, in which the ground is taken that our usual methods of treating catalepsy are faulty in the extreme. The author says: "Reasoning as we would in our present knowledge of hypnotism, and remembering what slaves to suggestion the hypnotic subjects are, we can see how, once a person is entering upon the cataleptic state, the usual remarks at the bedside tend to deepen and prolong the lethargy. The patient appears to be dying. The friends, believing this to be so, by their words and actions, deepen this impression upon the patient's mind. * * * When catalepsy is suspected or is possible all allusion to death should be avoided by the physician. Suggestion can induce catalepsy or prolong it. Suggestion is a potent means of restoration. Other means may be needed but rarely are. No violent means should be employed. Cheerful, confident demeanor is needed and time should always be allowed for recuperative forces to work."

*The methods of resuscitating the fakirs is worthy of notice. The plugs are removed from ears and nose, friction and hot water bathing applied to the body, the eyelids oiled and gently rubbed, the tongue annointed and gently drawn forward and hot, moist compresses applied to the top of the head.

Clinical Society Transactions.

CORNELIA S. STETTLER, M. D., Corresponding Secretary.
ORRIN L. SMITH, Recording Secretary.

APRIL MEETING, 1897.

The regular monthly meeting of this Society was held in the Amphitheatre of the Hahnemann Medical College at 8:30 P. M., on Saturday, April 24, 1897, President Shears in the chair.

REPORT OF THE SECTION ON THE DISEASES OF CHILDREN.

HANNAH J. PAYNE, M. D., Chairman.

XXIII. Rhachitis; its etiology and pathology. By Dr. Joseph P. Cobb.—*Etiology.* In the United States rhachitis is comparatively infrequent in the country and in those parts of the city where people appreciate the value of pure air, sunlight, cleanliness and a proper diet. I am satisfied, however, that it is more prevalent in our large cities than many of us realize.

In the absence of the bony deformities, which are often late developments, the fretfulnes, tenderness of the surface and joints, profuse perspiration, delayed dentition, anæmia and general ill-health, are often attributed to other causes. This is one of the reasons why a larger percentage of cases are reported from asylums, hospitals and dispensaries than from among those of equally vitiated parentage outside of such institutions. Both in Chicago and New York the greater number of cases are observed among those of foreign parentage, who, as a rule, are more closely crowded together, who are of a lower grade of intelligence than American born citizens and have less regard for dietary and hygienic requirements. In families of American parentage the disease is more common among the negroes, who are proverbially improvident and gregarious. Nevertheless cases occur among the well-to-do families, even when they live in fairly hygienic surroundings. In such instances the cause can often be traced to a faulty dietary.

Special attention has of late been called to what may be termed the maternal factors in the causation of this disease. Among the ante-partum causes may be men-

tioned, ill health, malnutrition, or disease of the mother during pregnancy, numerous and rapid pregnancies, advanced age of the mother at the time of conception, lactation during pregnancy, and syphilis. While rhachitis is more common among children who are artificially fed, it does occur among those who are fed at the breast.

A lack of the proper proportion of fat in the baby's food seems to be an almost invariable accompaniment to the development of rhachitis, whether in a nursling or an artificially fed baby. This condition is present in almost all of the proprietary foods of the market, and largely accounts for their causative influence. This lack of the proper amount of fat is found to be the most constant and persistent variation from the normal standard of milk in mothers where any of the above mentioned factors are present.

The theory that lactic acid in excess is the causal factor in the production of rhachitis is not borne out by recent research, nor will a careful analysis of its chemical affinities permit such a conclusion. In feeding lactic acid to young animals it is found that rhachitis is not produced unless their diet is seriously restricted in other ways; in many cases of rhachitis there is no evidence of any excess of lactic acid. Moreover, lactic acid produced in excess by faulty digestion would quickly unite with an alkaline base (soda or potash) in the blood. These salts are always present in the blood, and the lactic acid would not be allowed to reach the bones with its selective affinities unsatisfied.

A summing up of the evidence of to day warrants the statement that the chief etiological factor is dietetic—a failure to receive, digest or assimilate certain important food principles, notably fat; the majority of cases occur in artificially fed babies, or after weaning; the dietetic influence may operate immediately or through the mother. Antihygienic surroundings, by lowering the vitality and vitiating the food are accessory causal factors. Vitiated heredity, particularly by syphilis, plays an important part.

Pathology. As long as observation and investigation was restricted to the osseous system rhachitis was considered an inflammation of the bones and cartilages. This was the position occupied by Virchow. Niemeyer says: "It seems to me that the most probable hypothesis regarding the cause of rhachitis is that which refers it to inflammation of the epiphyseal cartilages and periosteum." Many

of the structural changes in the soft tissues due to rhachitis are not such as ordinarily belong to inflammatory processes. Billroth, who recognized the changes outside of the osseous system, wrote of rhachitis that "it cannot be exactly classed among the chronic inflammations, although nearest related to this process." Later investigators regard the disease under question as a constitutional dyscrasia affecting the nutrition of various tissues of the body, and producing changes in the osseous system, which are either inflammatory or closely allied to inflammation.

It seems to me that too little attention has been given to the deviation from the normal standard of the blood. Anæmia in some degree is usually a part of the rhachitic developments, and carries with it its pernicious blood composition. The number of red blood corpuscles is always below the normal proportion and the percentage of hæmoglobin will vary in the same proportion. The white corpuscles are also at variance with the normal standard; they may be simply deficient in number or deficient in development; in pronounced cases they are abnormal in both of these respects.

While these observations are true in varying degrees for all rhachitic children, in the case of those presenting splenic enlargements, it becomes a more pronounced factor for evil. In such cases the number of *erythrocytes* and the percentage of *hæmoglobin* have been found less than one-half the normal proportion, while more than three-fourths of the *leucocytes* have not been developed up to a good working standard. This is a pathological condition of the disease and very materially affects the ability of the different organs to do their proper work. During infancy the blood of all tissues is taxed the most by the extra demands made upon it for growth and development, and to its inability to meet these demands may be ascribed in part the deficiencies of other tissues.

The skin in mild cases is but little involved, except in the way of profuse local perspirations; since these local perspirations are prone to select the same site, viz., head, face and neck, and because they are frequently not accompanied by any fever they are probably due to some central influence exhibited upon either the vaso-motor or sweat centres; this influence, if accepted, must be nutritive and due to change in the supply or quality of the blood. Catarrhs of the mucous surfaces are common lesions in rhachitis, and usually give rise to some elevation

of temperature; this tendency to mucous inflammation is an accompaniment of all conditions where malnutrition is persistently present; the result is in part due to the change in the structure of the mucous membrane itself and in part to the changes in the blood and the circulatory apparatus, including the vaso-motor centres.

In some cases the muscles throughout the body become shrunken and flabby; in others the ligaments are relaxed giving unusual mobility to the joints and unsteadiness to the movements. This lack of proper tone of the muscles and ligaments helps in producing some of the various deformities common to rhachitis. The spleen is enlarged in about one-third of all cases; when present it is a result of cellular proliferation of the connective tissue; it is not an inflammatory growth; and it is well to remember that the enlargement usually causes an impairment of the organs' capabilities because of the encroachment upon the working elements by the connective tissue growth.

The liver, in advanced cases, is usually displaced downward by the lateral depression of the ribs; but carefully conducted examinations show that enlargement and structural changes of the liver only occur rarely in rhachitis. The protrusion of the abdomen is due to various causes. The lateral depression of the thoracic walls crowds the liver and spleen lower down; impaired digestion produces a greater amount of gas in the stomach and intestine, while the poor tonicity of the intestinal muscle makes distention easy; the rhachitic shortening of the spinal column brings the thorax and pelvis nearer together.

The influence upon the nervous system of the rhachitic anæmia is one of its most baneful and lasting effects. The nervous tissue, like the osseous, does not receive its proper building material; it is starved, and consequently is improperly developed—the nerve centres seem to suffer the most severely, and certain ones apparently more than others. Rhachitic children are often precocious in their mental development, but they are irritable, easily unbalanced, and more prone to develop some form of nerve storm. In part, we should ascribe this imperfect tissue development to faulty activity of the trophic centres; next in importance to these nutritive influences I should place those belonging to the inhibitory apparatus—the inhibition of reflexes in these children is always imperfect, they do not learn to disregard peripheral impulses which demand no consideration. An impulse which should give rise to

only a limited reflex response is not confined to its simple route, but is transferred to other centres and calls out unnecessarily complex reflexes. In a similar way volitional inhibition is not well developed, and there is not the proper mental control even in those whose minds are precociously active.

To this lack of inhibitory control and the abnormal irritability of nerve terminations is due the fact that these children are prone to suffer from partial or complete convulsive seizures. *Laryngismus stridulus* is rarely met with except in rhachitic children, and by many observers is claimed as a diagnostic symptom of the disease. Convulsions, which may occur in any child during early infancy, are liable to follow the rhachitic child through several years of its early life. Convulsions occurring after the end of the first year should always excite a suspicion of this disease.

Whenever tetany is present in infancy it is in rhachitic subjects. Other forms of nervous irritability have been observed in these children, and Erb has pointed out the fact that there is an increased electric excitability of the nerves to both faradism and voltaism; that the mode of reaction to the voltaic currents is altered, and with positive and negative opening there occurs a prolonged contraction or tetanus. The muscular system is never as well developed, its tissue does not present the normal tonicity, it has not the same power of performing work, and it cannot as readily recuperate after exhaustion of its excitability.

The glandular apparatus suffers both in its structural and functional developments. Individual glands may be abnormally large; this enlargement is due, however, to increase of connective tissue, with a corresponding diminution of active cell structure; the capability of the gland is usually in reverse ratio to its abnormal developments. Non-assimilation is always a factor of rhachitis, and in the shape of chronic catarrhal gastro-enteritis and persistent dyspeptic diarrhœa may be its herald, or at least its first manifestation. When the disease is well advanced we could hardly expect anything else. Its low standard of blood structure, inefficiency of nervous control, with consequent proneness to venous stases, its tendency to excessive mucous secretions and its impaired organs and tissues offer all of the conditions possible for impaired food metabolism and assimilation.

In reference to the bony changes I wish to make this

observation, viz. : that rarely does any one child present all of the possible osseous deformities or peculiarities. The *rhachitic rosary* is often absent; so are any marked epiphyseal enlargements. Craniotabes are only present in extreme cases, but cranial bossa with a peculiar cranial contour are in some degree usually present. While the brachecephalic cranium with its flat top, boxlike sides, its square appearance and overhanging forehead is the more common type, we should remember that another type with an exaggeratedly long antero-posterior diameter is equally as characteristic. In this class the craniotabes are not usually to be observed, but the bossa, flat top and overhanging forehead are present. Ossification is a twofold process which suffers in rhachitis in both particulars. The cartilaginous and subperiosteal cell growth which produces ossification goes on with increased rapidity and in an irregular manner, while the actual ossification is equally irregular or even wanting. The second part of the process, the absorption of preliminary formations and the construction of medullary and other canals, is excessively active. There is a deficiency of building material, and one part is robbed to supply another.

XXIV. Rhachitis; its morbid anatomy and histology. By Dr. A. C. Halphide, M. D.—Rhachitis offers a rich field for the practical pathologist, for so much still remains to be learned. The later developments and deformities are much better understood than the earlier ones. They are important but the beginnings are more so. When it is possible to recognize the disease in its incipiency and treat it from a prophylactic standpoint, we shall have reached an enviable position. Doubtless there are signs which would guide us to that vantage ground if we only had eyes to see them.

The blood. The blood affords a means for the study of morbid processes of the utmost importance. Many important facts have already been observed. Doubtless, Mrs. Chairman, you had them in mind when you asked me to write this paper. A disappointment is unavoidable, however, for I am unable to give anything very satisfactory upon this point. I have not made a sufficiently large number of blood analyses of rhachtical subjects to warrant any dogmatic statements. Nor have I seen the report of any thorough investigation. This much, however, we are safe in stating. Leucocytosis is regularly found in these

subjects and the number of red blood cells is diminished and the percentage of hæmoglobin is reduced. In other words, we usually have an anæmia more or less pronounced.

The bones. We find the most marked changes in the osseous structures. Indeed, the earlier writers upon this disease recognized no others. These changes are profound and important, but are so late in the development of the disease that they are certainly not the most important. In order to secure the best treatment of the disease the earlier changes must be sought and recognized. The changes in the structure and form of the osseous system are due to two principal causes, first and chiefly to the manner of growth of the bones, but also to the relaxation of the ligaments and traction of the muscles. Long bones grow in length and thickness. In length by the proliferation of the cells of the intermediate disc of cartilage between the epiphisis and diaphisis, in thickness by the deposition by the circumferential layers of bone beneath the periosteum. The chief histological changes are due to a loss of balance in these modes of development. This loss of balance appears to result from faulty nutrition, which in turn depends upon two factors; an impoverishment of the quality of the blood and an enfeebled circulation. The causes of the poverty of the blood will be discussed by another, but the enfeebled circulation should be mentioned here as being due to one structural and two physiological conditions, namely: the weakness of the heart and the relatively large size of the vessels and the relaxed and weakened muscular action.

The congestion of the bones and the periosteum, depending upon the sluggish circulation, often approaches an osteitis and a periostitis, but it never quite reaches those conditions. At any rate suppuration in these cases is very rare. In the normal bone the cartilages between the epipheses and diaphises are regular in outline and the line of ossification is even and is preceded by cartilage cells arranged in rows along a definite zone. This regular arrangement is lost in rhachitical development. The cartilage cells are found in irregular heaps and the line of ossification, instead of being narrow and sharply defined, is lacking in uniformity, being frequently broad and illy defined. Areas of ossification are often found isolated in the cartilaginous band, and in like manner patches of cartilage are found in parts of the bone which should be wholly ossified.

The swelling of the epiphises is due to the excessive proliferation of the cells in the intermediate cartilages, and this increased cells growth produces the peculiar knobby swellings so characteristic of the disease.

The rapid increase of cells beneath the periosteum, the irregular calcification and elaboration of the bone results in the formation of loose, spongy, instead of compact lamellated bone tissue. At the same time, the medullary cavity is enlarged and the inner layers of the bone become spongy and fragile. The cut surfaces of the shaft is exceedingly red and vascular, the bony lamellæ are thin and friable and it is evident that rapid absorption is going on. The marrow is rather large in amount, and is red and gelatinous instead of yellow and fatty.

The result of these processes is that the bones become too weak to stand the strain of the muscles and external pressure, and all sorts of deformities follow from the displacement, bending and breaking of the weakened bones.

Other bones beside long ones are similarly affected, but space forbids speaking of them in detail; however, a few words should be said with reference to the bones of the cranium. Perhaps no one feature of the disease is more common than the square shape of the head, which is partly due to development and partly to pressure. The bones are spongy, soft and hyperæmic, and at their edges spinous projections may be felt beneath the periosteum. Wormian bones are often found along the lines of the sutures, and sometimes nonossified, membranous spots are found, especially in the occipital bone, this latter constituting the condition known as craniotabes.

The narrow chest with prominent sternum and depressed ribs is in marked contrast with the large, square head. The costal cartilages at the juncture with the ribs are, like the epiphiseal cartilages, frequently enlarged; and these rows of enlargements form what is known as the rachitic rosary (see Fig. 16) which represents a longitudinal section through one of the rib ossification zones.

These enlargements subside as the patients recover, and many of the deformed bones regain approximately their normal shape, while some of the more marked deformities persist throughout life. The bones are changed from the soft, porous to the dense bone. Many of the bones become much denser than normal, especially the long bones, and the bones of the cranium.

The muscles. The muscles of the infant are feeble,

and the ligaments lax, and it is not surprising that a profound constitutional disease, like rickets, should increase their insufficiency. Many of the more marked deformities in this disease are caused by faults of the muscular rather than of the osseous structures. What has been termed rhachitical pseudo-paralysis is a confirmation of this statement. Strabismus, scolioses, kyphosis and so forth are very common in rhachitical children or those who have

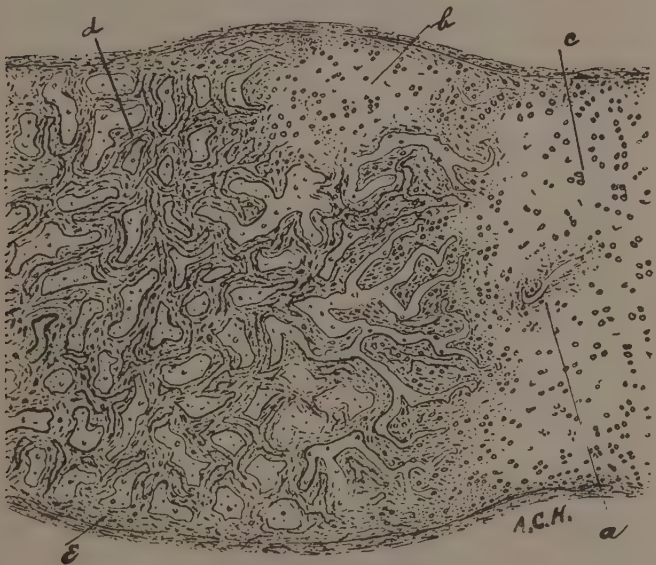

FIG. 16.—RHACHITIC BONE.

a Cartilage. *b* Bone. *c* Bony islet in cartilage. *d* Cartilage focus in bone. *e* Subperiosteal bone.

been so. Not because of any other influence than the laxity of the ligaments and the flabby insufficiency of the muscles. And the voluntary muscles are not alone affected. The feebleness of the infant's muscles when intensified by rhachitical malnutrition is evidenced by nothing better than the insufficiency of the intestinal muscular tissue. Jacobi calls attention to the constipation due to this muscular insufficiency as of great diagnostic value as follows: "Even the early cranial changes of rhachitis are

not so perceptible as to be positive evidence of that disease, but this constipation is."

I have a case under treatment now (see Fig. 17) which

FIG. 17.—RHACHITIC DEFORMITIES.

illustrates the flabby, insufficient muscular condition, as well as most of the other points characteristic of this disease. Earlier in her treatment she had what appeared to be a pure drop-wrist but which proved to be nothing more

than a true rachitic pseudo-paresis. And now, at two years of age, she is unable to walk, indeed, she cannot stand alone. These cases under proper treatment make good recoveries. There is a popular impression, and not without some basis in fact, that adults who show traces of having had rachitis in childhood—such as bowlegs—are apt to have an unusually good muscular development.

The histological changes in the muscles are not so manifest as might be expected. There is generally an atrophy of a marked character, but rather simple than numerical.

The brain. The numerous nervous symptoms presuppose some changes in the cerebro-spinal center. Where there is much smoke, there must be some fire. That the changes in the brain have much influence upon the shape of the head is very doubtful. In craniotabes the congestion of the brain and meninges is intense and not infrequently accompanied by an effusion. When the effusion is great it undoubtedly acts as a factor in the shape of the head. Than this intense hyperæmia no other changes are found by histological investigations and that there are none of severe import is evidenced by the complete recovery enjoyed by these subjects. Like the bones which, after recovery, are more solid and stronger than normal ones, the brain of rachitical children appears to develop favorably, the large, square heads combined with short, thick-set limbs often belong to the best scholars at school and the most enduring intellectual workers among adults. Thus to a certain degree the pronounced hyperæmia of rachitis in some instances is rather a benefit than otherwise. But in some cases it ends in hydrocephalus. The theory that a hyperplasia of the brain is a frequent condition in rickets is not justified by post-mortem investigations.

The viscera. The weakness of the heart and the relatively large size of the arteries have been referred to and are due probably to the insufficiency of the muscular system which has been discussed above. The alimentary tract apparently suffers from the same cause. The stomach and bowels are frequently dilated and their walls thinned and their functions more or less disturbed. The prominence of the abdomen is not due to this cause, at any rate, not so much so as to the forcing of the viscera downward by the narrow thorax and depressed diaphragm.

The narrowness and compressed condition of the chest render the action of the heart and lungs labored. The

lung beneath the line of depressed ribs is often in a state of collapse while the adjacent portions are emphysematous. This compression together with their muscular atony exposes both lungs and heart to various complicating affections and accounts for the apparent displacement of the heart. The impulse of the heart is usually very perceptible on inspection and palpation, and the apex beat is diffused because the triangular or quadrangular and flattened chest allows the heart to touch a larger surface than in the normal chest.

The spleen is usually enlarged as has been shown by the cases that have come to autopsy and also by percussion in many cases. The enlargement is due to an hyperplasia as is also that of the lymph glands. This cellular proliferation of the lymphoid tissue probably accounts for the leucocytosis mentioned when speaking of the blood. The liver is not so often enlarged as is generally supposed, however there are cases of true hyperplasia. The compression of the lower ribs forces the liver downward and this displacement is frequently mistaken for an enlargement.

There are other topics which should be mentioned, such as the catarrhal condition of the mucous membranes and the sweating of the skin, but no reliable data are to be had upon these points. It is not at all certain whether they are of nervous or circulatory origin, so we refrain from discussing them.

XXV. THE SYMPTOMS OF RHACHITIS. BY DR. F. H. HONBERGER.—Rhachitis, or rickets, is a chronic or semi-chronic affection, the symptoms of which are said to appear before the end of the first year. My experience with this disease has been rather limited, having seen but a few of the lighter cases, and what I have to offer must necessarily come to a great extent from the different authorities.

The more active symptoms of the disease are observed between the third and fifteenth months. As a rule the rhachitic patient is anæmic, although rather fat and flabby; the tissues are soft and have but little resistance; they are prone to suffer from hypertrophy of the glandular structures, especially the tonsils and lymphatic glands of the neck.

The mucous membranes are very vulnerable, the slightest error in diet may bring on an attack of acute indigestion or diarrhœa, and from slight exposures you may find catarrhal inflammation of both large and small air pas-

sages, which are quite apt to run a somewhat protracted course. One of the earliest spmptoms observed is the anæmic condition; the sensitive stomach, which is inclined to be extremely acid; bowels very sluggish and as a rule constipated, but the opposite condition is brought on by very slight causes. Protuse and persistent perspiration of the head and upper part of body, this is especially true of the head and face during sleep, frequently being of sufficient quantity to wet the pillow upon which it rests. The child is extremely restless both day and night, rolls about during sleep, kicking off the clothing and never has the quiet natural sleep of a healthy child.

When a patient is presented with the above general symptoms that have continued for some time you will probably be able to find some of the osseous or more pronounced symptoms of the disease. Deformities may be found in a few or in severe cases in many of the bones of the skeleton. The first of the osseous structures to show the affection are the ribs, but we will begin with the changes observed in the head.

The general appearance of the head is that it is too large, although perhaps not larger than that of other healthy children of the same age, it is proportionately too large, the shape is somewhat square, flattened above and at the back, the forehead is prominent and bulging. In extreme cases you may find marked prominences upon both frontal and parietal bones, due to a thickening of the osseous structures themselves, usually at the site of the frontal and parietal eminences. The sutures and fontaneles remain open an unusual length of time, the anterior fontanelle which should close in from fifteen to eighteen months may remain open until the end of the third or fourth year and cartilaginous until the end of the sixth year. The posterior fontanelle and lambdoidal suture instead of closing at the third month after birth may yet be open at the fifteen or even eighteen month, the frontal and sagital sutures may be ununited at the end of the second year. Soft spots (crania tabies) may be found in the occipital bone, varying in size from one-fourth to three-fourths of an inch in diameter; usually in that portion of the bone adjoining the lambdoidal suture, the occiput becomes very sensitive, so much so that the child will roll and bore its head into the pillow. Relief at times can only be obtained by raising the child into an upright position or by turning it over with its brow upon the pillow, thus removing all pressure from the occiput.

Rhachitis also invades the jaws. The teeth cease to grow; the first incisors may not be cut until the fifteenth or eighteenth month. They frequently turn black and crumble down, owing to an absence of the enamel, the teeth do not appear with any regularity when they are postponed to so late a date, a canine or a molar at times precede the incisors.

The thorax. Perceptible changes in the thoracic walls are rarely found earlier than the age of six months. One of the first symptoms of a rhachitic chest is marked pain upon pressing the chest wall, as by lifting the child by placing a hand upon either side of the chest beneath the axilla. When thus lifted the child will cry, and again become quiet as soon as put down and the pressure is relieved. The first osseous lesion observed is a beading of the ribs; *id est*, a formation of hypertrophied nodules at the junction of ribs with the costal cartilage. These nodules, usually of small size, may in severe cases become quite prominent, and are inclined to be largest on the inner surface of the ribs. The chest wall becomes contracted from side to side, while the antero-posterior diameter is correspondingly increased. In some cases a prominent bulging of the sternum takes place, giving rise to a condition called pigeon-breast; the ends of the sternum and the enciform cartilage being depressed, as are some of the lower ribs, causing a contraction of the lower part of the thorax, probably from attachment of the diaphragm, thus causing more or less depression and bulging of the liver, stomach and spleen; not necessarily from enlargement of these organs, but from displacement downward.

Deformities of the pelvis cannot usually be observed until the child is far enough advanced to walk. The most frequent found is a shortening of the antero-posterior diameter, and a narrowing of the subpubic arch with a more or less flattening of one or both sides.

Extremities. Rhachitis of the extremities first appears as enlargements upon the epiphyses of the radius and ulna at the wrist joint. These appear somewhat later than those found upon the ribs, probably about the end of the first year. Enlargements may also be found at the knee and ankle joint; the extremities of the long bones become enlarged at the expense of the length and development of the bones, leaving the limbs shorter than of a healthy child of the same age. This shortening of stature may

remain throughout adult life. As a result of the lack of ossification of the bones, the extremities may become distorted, curved and bent in almost any direction, as well as to almost any degree. "Bow legs" and "knock knee" are two of the most frequent deformities. Rhachitic children are usually from three to four years of age before they are able to walk.

The ligaments of the entire skeleton share in the softening, giving an unusual amount of mobility to some of the joints, in some cases actually causing deformity.

A large, distended abdomen is an early symptom of the disease, and is called the "rhachitic pot-belly." It is, as a rule, quite evenly developed, and tympanitic over the entire abdominal cavity. Some authors claim there is a febrile stage of the disease, but it is denied by others. However this may be, your rhachitic patient is very susceptible to little ailments, and frequent elevations of temperature may be expected.

XXVI. The nervous symptoms of rhachitis. By Dr. Orrin L. Smith.—The exacted brevity of a paper upon the nervous symptoms of this Æsopian disease, first scientifically described by Glisson, I believe, almost precludes a much deserved study from the standpoint of physiology, pathology, and the clinical results of treatment, when it becomes an Icarian diatribe, a farcical recitation of text-book symptoms to which even the Clinical Society is no stranger. Certain neurologists, Pommer and Tedeschi declare, and very cleverly, too, that rhachitis is purely a nervous disease.

As another will carry you through the general symptomatology, it remains to endeavor a divorce of the nervous phenomena, a process more easily accomplished in any other specialty than in neurology.

Of the early symptoms we have observed mental and physical hypersensitiveness to be fairly constant, persistent and always significant. The latter condition, however, must not be mistaken for the bodily tenderness that develops coincidentally with the osseal involvement, yet the two are more frequently confounded than not, and perhaps because no one has thought to emphasize the fact that in the former instance the child is much averse to cutaneous or superficial contact, and thus we know why they persist in "kicking off the clothing," and sleeping in nature's pajamas, hence their increased and well-known suscepti-

bility to "taking a cold" that a normal child would escape. The rhachitic child objects to be carried and fondled because of the deep pressure affecting the now involved viscera and the bone. Mother and nurse emphatically declare baby cross, peevish and proof and even averse to the usual blandishments of babyhood. That this neural hypersensitiveness accounts for the restless, broken sleep, "crying out," and so called "night terrors"—where they awaken with a scream, much frightened and unable to recognize for some time the mother or attendant, the meanwhile pacific measures proving useless—we are convinced, although by no means denying the contributary effect of disordered circulation and digestion. That this mental and physical condition is somewhat peculiar to rhachitis and not the result of simple malnutrition, one has but to remember that in the latter instance, nervous sensibility is lessened and even impaired.

A second initial symptom is excessive transpiration about the head, which does not prove to be the ephemeral perspiration incident to feeding, overdress, temperature, etc, but invariably persists during diurnal and nocturnal sleep, and that independent of cold or heat, beside being easily precipitated during waking hours from most trivial causes. It is not confined to the head, but includes the face and neck, habitually being so profuse as to wet the pillow and contiguous clothing; the lower two thirds of the body remaining dry, however. In our reading we have never encountered an explanation of this symptom. Now we do not mean to insinuate that because baby is cross and perspires from a pin prick or barometric drop that rickets is to be diagnosticated, but we do say that when these two symptoms are obtrusively present a thorough examination is demanded.

The balance of opinion inclines to the view that this same increased neural and neurotic sensitiveness determines in most cases the various and well-known convulsive states, while admitting that the reflex point of departure may be located in the digestive tube, a simple digestional irritation or autotoxæmia, and indeed it is quite natural that these various and as yet imperfectly developed, illy-nourished and unduly sensitive higher centres suffer first from the starvation, a diminution in this power to control, thereby liberating the energy of the lower centres.

Glottis spasm and its complexity, laryngismus stridu-

lus, are perhaps the most frequent exponents of the convulsives, the attacks being prone to occur during the months of January, February and March. Some authors have endeavored to attribute the laryngismus to the craniotabes of Elasser—round spots of local, parchment-like thinning disposed over the occiput and parietals, due to osseous absorption from the pressure of the brain within and pillow without—but there is no substantiating physiological reason, for the centres for vocal movements are far away from that part of the brain which is apt to be compressed in these cases in the first place, and in the second place, pressure upon the skull even at these spots does not cause an attack, and lastly these attacks are not infrequently absent in children with cranio-tabic skulls and contrarywise, so it seems manifestly more rational to regard each as an evidence of rhachitis. Pronounced attacks of "holding the breath" are usually precursors of the more serious laryngeal types.

As you know, the convulsions occurring after the first six months differ from the earlier seizures, both in etiology and character, the greater number being occasioned by the rhachitic state, as a predisponent with digestional and dentitional disturbances as a direct excitant. While ordinarily not the severest type, yet we have the notes of a case in which it was quite the usual thing for the attacks to persist for six hours. Imperfect or partial attacks are quite common. Infantile tetany is pretty generally conceded to have a rickety etiology. Usually the subject will have suffered some one of the minor attacks, when finally ensues the characteristic contraction described by Trousseau, and not infrequently consorting with laryngeal symptoms. The tetanic condition involves principally the upper limbs, there existing rarley a mild degree of opisthotonos. The contractions are evidently painful and may continue several hours with remissions that may last for days and even weeks. Early in the attack neuro-muscular irritability is increased, but gradually declines in inverse ratio with the progress of the attack.

We are at loss to explain the unfortunately prevalent belief throughout the professional ranks regarding the alleged but mythical rhachitic paralysis. In fact it does not exist, but is purely a pseudo-paraplegia, or spurious paralysis, proceeding, not from neural implication, but bodily soreness and tenderness, ligamentous laxity, deformity and muscular weakness. Once the disease is well advanced

neural depletion occurs relatively only, and never to a paretic degree even. In 10 per cent of the cases enuresis is present and evidently due to the rachio-neurosis.

Apart from the Olympian forehead, etc., the brain is somewhat larger than normal, probably from neurogliar increase. Occasionally a mild degree of hydrocephalus exists, much less frequently, however, than is popularly supposed.

Mentally, certain of these unfortunates are sprightly and of rather more than average intelligence, others imbecilic or idiotic, while the majority are dull, drowsy, "backward" children, slow of apprehension and special sense cultivation, and late in learning to walk and talk.

XXVII. THE HYGIENIC AND MEDICAL TREATMENT OF RICKETS. BY Dr. HANNAH J. PAYNE.—In the treatment of rickets let it be kept in mind that it is a disease of development, the active period being within the first two years of the child's life; that after this time very little can be done but to endeavor to correct the injuries caused during this period. The affection of the bones, so striking and so obvious, has given this characteristic of the rhachitic state undue prominence and importance and rickets has been in danger of being regarded as simply a morbid state of the bony structures; but the rickety child suffers from general constitutional debility of various forms.

It is soft fleshed and flabby, oftentimes the muscular feebleness being so great that it cannot sit upright. Relaxed ligaments produce the yielding ankle, knock-knee or curved spine. Many times the feebleness is so extreme that the child is supposed to be paralyzed. Other signs of constitutional debility are the general anæmia, profuse sweats, tendencies to catarrhal conditions of all mucous membranes. The lungs are injured or there may be a friction patch over the heart and a pressure murmur. The nervous system suffers greatly, giving the many manifestations so well known to the profession. All these things must be borne in mind in the treatment of this disease.

Prophylactic. While there is no conclusive proof that rickets is hereditary, yet that a weakly constitution is transmitted we know. That the mother's health during pregnancy should be kept at the maximum is of first importance. She should avoid anything which impairs the general health. Her hygienic surroundings and diet should be carefully directed and she should avoid irregularities

and excitement. Too frequent child-bearing should be avoided, and also too early or too late weaning of the child. Nursing during pregnancy should be prohibited.

If in the family there is a predisposition to rhachitis, calc. phos. given to the mother during pregnancy, it is claimed, will do much toward giving the child a good start in life.

Conditions of mal-hygiene are not constant factors in the production of this disease, for many cases arise where the patients are under excellent sanitary conditions as far as air, light, cleanliness and warmth are concerned; but it is true that the failure to have the patient surrounded with these conditions favors the production and development of rickets.

Give the child pure air. This is often very difficult in the unsanitary quarters of the large cities. Order the child taken out in the open air every day (care being taken to have it well protected during inclement weather). In the fall, winter and spring order it taken out during the part of the day when it is apt to get the benefit of the sunshine. Endeavor to have these babies taken to the open spaces—parks, boulevards or lake shore—during the summer season. This is not easy to do in some parts of our city. If circumstances are such that these children can be given the benefit of the country or the seashore air, it should be done. If the parents are forced to live in the crowded tenement districts (and here is where rickets prevails), cleanliness of apartments and ventilation can be obtained. This question of ventilation is difficult to meet, especially in the winter season.

Bathing. Proper bathing is of great value. Let the temperature of the bath be about 90° F until the sixth month, then gradually reduced to 70° F at the twelfth month. Let the bath be short and followed by a thorough rubbing. A weakly child should have a sponge bath only. Advantage may be gained by a shower (first the temperature of the bath, then gradually cooler) on the back, or a full shower for a very short interval, this followed by a vigorous rubbing or massage with olive oil. An alcohol bath, one part alcohol to two parts water, is stimulating and aids in peripheral circulation. An occasional sea salt bath is excellent or a salt glow.

These children are very liable to blue, cold extremities. This should be given special attention by rubbing them frequently before the fire or a hot oven, until they are warm

and comfortable. With these children it is sometimes well to rub the body before bathing. It may be rubbed with olive oil, then soaped and then let the bath be very quickly given.

Clothing. The clothing should be carefully looked into. A rhachitic child should never be allowed to be cold. I would recommend in this changeable climate, flannel next to the body, winter and summer.

As these children are predisposed to catarrhal conditions of the mucous membrane of the intestinal tract, I would have the abdomen protected by a flannel band even if the mother insists on taking off the other flannels during the very hot summer weather.

Let the extremities be always well protected. I have already emphasized the necessity of stimulating the peripheral circulation.

Food. The only constant factor always present in rickets is the food factor, and many times it is the only factor. The fault of diet is the commonest and most potent cause of all. Dr. Joseph P. Cobb in his lectures on pædiatrics constantly emphasized the quantity, quality and regularity of feeding. In this disease it is the quality rather than the quantity of food that is at fault, and it is to be cured by a diet adapted to the deficiencies of previous feeding. As soon as the disease is recognized, look for a cause in the food.

Too often food is chosen without any estimate of its relative digestibility. If one food does not agree, another is chosen and substituted haphazard without knowledge of its ingredients or whether it is adapted to the needs of the child in hand, given perhaps because some other child has done well upon it. Many times a child is starved of fat in its daily food and to make up for this, is afterward drenched with cod liver oil. Dr. Cheadle in his work on infant feeding, has shown that in this disease, the fault is in the deficiency of the proteids and fat or overfeeding on a starchy diet. Rickets is not always found in the artificially fed. While it is seldom found in a child well fed upon the breast milk, still even here it does exist.

I would advocate (and have begun now in my early practice) to have the mother's milk analyzed. This frequently is found to be lacking in the constituents necessary for the proper development of the child. Let whatever error found in the mother's milk, be made up for by a carefully prepared adjunct. One of my first cases was a baby

three and one-half months, brought to me by a young mother who claimed that the child seemed not satisfied after nursing. In addition to the nurse she found it necessary to give several ounces of warm water containing condensed milk. The baby was restless, troubled with colic and was not growing as it should. It was apparently a fairly well nourished baby, and I was at first disposed to give some directions for feeding and an indicated remedy, but on second thought it occurred to me that there might be some error in the mother's milk which would show itself later in a more serious form. I ordered a sample of the milk analyzed by the Walker-Gordon laboratory and it was found as follows: Fat, 1.8 per cent; albumen, 1.5 per cent; sugar of milk, .7 per cent; salts, .33 per cent, which you see was deficient in fats and proteids. Four feedings of 4 ounces each, containing fats, 4.5 per cent, and 1.25 per cent albumen, sugar 6.5 per cent, and .2 per cent of ash was prescribed. The baby began at once to gain one pound a week of solid hard flesh. It was contented and slept well to the delight of the parents.

This I consider the best way to get at the question, but the disease is most often found among those too poor to employ this expensive means of supplying their children's needs, but that does not bar our ability to analyze the milk, thus enabling us to prescribe in the light of our knowledge of the deficiencies.

There are many ways of preparing foods for these children. I shall not enter into the discussion of prepared foods, but refer you to many interesting and instructive articles written upon this subject by the more experienced.

A food that agrees with one baby, and upon which it thrives and grows strong, may not be agreeable to another. There are many artificial foods upon the market prepared more for their commercial profit than for their real value to the child. We know that in the first two months of infant life, the diastatic ferment in the pancreatic juice is absent, and is only slightly developed at the sixth month, not fully developed until the twelfth month, and yet, in spite of this fact, most of the artificial foods have starch for their chief ingredient.

In milk the carbohydrates are in the form of sugar of milk; the starch is converted into sugar in the mother before taken by the child.

Of the artificial farinaceous foods, they are to be commended in their proportion of nitrogenous matter and in

their proportion of the conversion of starch through some of its stages into sugar, but they are useful only as adjuncts to milk.

Those wherein the carbohydrates are in the form of dextrine maltose or grape sugar, are to be chosen in preference to sweetening with cane sugar, which must be converted into grape sugar before it can be assimilated, too; mixing this with milk, a smaller curd mass is formed. Of the malted foods, Mellin's comes to us most highly recommended. Dr. Tooker says that in his nearly twenty years' use of it, he has never seen a child become rickety upon it, and that he has seen children that had become rickety under other foods, restored to sound health by its use.

It is prepared more uniformly and more highly dextrinized. Many mothers, however, fail to prepare it with milk, using water instead. It should always be prepared with milk.

Condensed milk I find to be a favorite with many mothers, and babies grow very fat and pleasing to the mothers upon this food, but the muscles and ligaments grow soft and yielding, and among these we often find the *fat* rhachitic baby. I like the preparation used by Dr. Cobb in his clinical and hospital practice in Hahnemann Medical College, viz.: Milk, one ounce; cream, two ounces; water, two and a half ounces; lime, H_2O, one half ounce; sugar of milk, one and three-eighths drams—changed in proportion and amount, according to the age and special needs of the infant. This most closely simulates mother's milk in amount of fat, albumen, and mineral salts, and has a light curd. I have seen such satisfactory results obtained by this food in the past four years of observation in the clinical and hospital work of this department that I can speak of it with the highest praise.

As soon as rickets is found active in the child, reduce the carbohydrates and give them nitrogenous foods and animal fats. The proteids may be added in the form of casein by giving more milk, or, better, substituting raw meat juice, while the fats may be supplied in the form of cream or cod liver oil.

We know that in this disease there is a deficiency of the calcareous constituents- either not enough of these salts in the system, or an inability of cells to derive the normal amount of the calcareous tissue for their development. There may be an imperfect supply or an imperfect condition of nutrition to enable the cells to absorb, or it

may be in such form that the tissues refuse to absorb, or, if absorbed, the tissues are not able to sustain and convert it into the anatomical elements.

It has been demonstrated that lime phosphate is present in every tissue, and it is thought that no cell growth can go on without it; it is present in large amount in rapidly growing cells. I would not endeavor to supply the earthy salts by giving mineral salts in the form of lime-water or hypophosphites, for the earthy salts are contained sufficiently in milk, raw meat and cream, and are thus in the best form to be assimilated.

The poor in our large cities are forced to feed their children upon the cheaper farinaceous foods, because they are unable to get milk and cream, and this explains why rickets prevails in these districts.

"On a diet in which the fats and raw meat juice are the leading ingredients, a rickety child grows rapidly strong, firm and hard in bone and muscle, loses its pallor, night sweats, feebleness and tendency to convulsions." It becomes vigorous, lively and robust far beyond that obtained by chemical foods, salts of lime or iron, or overdosing with cod liver oil, peptonizing and pancreatising (thus weakening the child's digestive functions.) Yet cod liver oil must be given in default of cream, watching that it does not prove too laxative.

Let there be a carefully selected diet and with this a well chosen homœopathic remedy to stimulate the cells, thus promoting absorption and assimilation, and I believe the best results are obtained in the treatment of this disease.

Remedies. As to remedies I have selected a few that are especially indicated in this disease and have given a few characteristics by which one may be selected in preference to another.

Phosphorus is the first remedy thought of. A proving of phosphorus gives the essential features of rickets. United with lime it is *the* remedy to be chosen for this disease. We want it both for its physiological and its dynamic properties. Calc. phos. gives us a perfect picture of rickets. Calc. phos. meets the subjective symptoms, while calc. carb. meets the objective symptoms.

The *calc. phos.* baby has dark hair and eyes, flabby, sunken abdomen, extreme sensitiveness of the bones, giving the indisposition to be handled, while the calc. carb. baby has light hair and blue eyes, is not sensitive to being

handled, the abdomen is distended and large. It is the remedy for the fat rhachitic infant. In *silica* we have a clearly indicated remedy for rickets. It meets the bony lesion and the nervous condition. In this remedy the complexion is pale, waxy, earthy; the baby sweats profusely about the head and feet and the sweat is offensive. In the calcareas the sweat is sour.

Sulphur meets the rhachitic symptoms. In sulphur there is defective assimilation. The child has a voracious appetite, it greedily takes everything that is offered as if it were starved, and still it is always hungry and looks emaciated. The food is not appropriated for the nourishment of the body.

Phos. acid must not be forgotten. It meets the extreme debility found in rickets. There is gurgling and rumbling in the abdomen with involuntary stool, also the sensitiveness of the bony structures is met with this remedy. Its chief sphere is upon the nervous system, while the physical action is upon the osseous tissue.

In the active development of this disease when there is an overexcitability of all the senses, restlessness and sudden startings,convulsive twitchings, throwing the body forward and backward or the head from side to side, tendency toward convulsion, etc., *belladonna* is the first remedy to be thought of.

Hyoscyamus is also an excellent remedy for the extreme nervous excitability with tendency toward epileptiform convulsions with incontinence of urine. The child suddenly sickens after eating, vomits and shows distress in stomach. It suddenly shrieks and then becomes insensible.

Stramonium meets the night terrors so troublesome in these children. The child awakens terrified, it screams with fright, knows no one. Upon awakening it is frightened at the first thing it sees and tries to get away from it.

There are other remedies which should be mentioned, among them mg. phos. and fluoric acid.

XXVIII. The surgical treatment of rhachitis. By Dr. A. L. Blackwood.—The surgical treatment of rhachitis may be considered under two heads:

First, The prevention, and

Second, The correction of deformity.

The former is confined to the acute stage of the disease and demands the close attention of the physician and attendants, while the latter concerns the stage of sclerosis.

Undue pressure, whether from the atmoshere, the weight of the body, or other causes, is bound to produce deflection of the softened bones; therefore the child should not be allowed to stand on its feet. The recumbent position is the best. A firm bed, one that will not sink from the weight of the body, is indicated, and no pillow should be allowed for the head while in bed.

The child should be watched that it may not assume any position which will cause deformity, such as crossing the legs, which is a favorite position, and one that has its evil effects. If allowed to sit up at all its shoulders should be well back and the trunk supported so that kyphosis, or scoliosis, may not be developed. Sometimes the attendant produces these deformities by carrying the child in a faulty position, such as hanging it over the arm, or in any way throwing it out of its erect position.

Manipulation, friction and electricity, if intelligently applied, are of service, but suspension and the application of a plaster of Paris cast has given the best results in preventing and correcting deformity about the trunk, especially during the first ten years of life. After this a brace, such as a Stillman's, is of service.

Unequal atmospheric pressure is responsible for a part of the deformity of the chest, and attention should be given the respiratory tract to see that there is no nasal obstruction, enlarged tonsils, adenoid growths, bronchitis or other pathological conditions that may prevent the free and full inflation of the lungs. In case any of these conditions be found they should be corrected.

Gymnastics which will develop the chest muscles and increase the pulmonary expansion are serviceable. The pneumatic cabinet has been a benefit in a few cases.

Slight deformities of the extremities are often outgrown if the general treatment is carried out. Tracing of the limbs should be taken from time to time on paper that it may be known positively whether the deformity is increasing or not, and if it is increasing splints or braces should be applied to prevent it; such as will allow the patient to move about as early as possible and to obtain fresh air.

Below the knee the condyles and malleolus are the bony prominences that should be taken as the fixed points, and the splints should be applied to the opposite side of the limb from the curvature, and a bandage should be applied that will bring the limb gradually to the splint. If the curvature is antero-external, a rectangular splint ap

plied to the posterior and inner sides of the leg is indicated. When the child is four years old, if not before, the bones are so firm that an apparatus is of little account.

My observations lead me to believe that many physicians lose a great deal of time and patience by trying to correct deformities by apparatus after the bones become hard. I know there is also a danger of operating too early and a subsequent bending of the bone.

In the operative field we can resort to osteoclasis, manual or instrumental, osteotomy, and the removal of a wedge from the bone. Regarding the relative merits of osteoclasis and osteotomy I would say the latter is preferred where the curvature is near a joint, or the epiphysis, when the bone is very hard, and where there are several curvatures, or the curvature is forward. There is also a possibility of injury to the soft parts from mechanical osteoclasis. I am not a friend of the osteoclast, and believe if a force is needed greater than can be applied by the hands that osteotomy is to be preferred. Manual osteoclasis is safe, and saves the time and trouble accompanying osteotomy. The bone should be broken and not simply bent, and left to the bandages applied to retain it.

If the curve is marked, a wedge-shaped piece may be removed, as in incurvation of the neck of the femur when the depression of the neck has reached its limit. This procedure will assist in restoring the power of abduction and inversion.

I have thought that the danger of flat foot following rhachitis has never received its proper attention. It is one of the chief causes in young children which result from knock-knee—the feet are separated by the deformity, and an excess of weight is brought to bear on the arch of the foot, and it yields. When the curvature is forward, the weight is forward, and again it yields. When the curvature is outward, the foot is everted in order to properly rest on the ground; the eversion causing it to weaken and flatten. A little care on the part of the surgeon can prevent this and save the child from the inconveniences of a flat foot through life.

Discussion: Dr. Sarah M. Hobson: Three cases in the past six months have shown rhachitic symptoms.

Case 1. A child of three, undersized, anæmic, complaining of weariness after slight exertion, refusing to walk; lower epiphyses of tibia enlarged and lower third of

tibia slightly curved anteriorly. Cream and eggs were added to the diet, also ten drops Philipp's wheat phosphates, three times a day. Calc. carb., calc. phos. and silicea, each for one month's time, 1 grain 3x trit. three times a day. After three months the mother reported steady improvement in strength, with increase of weight, and that the child had never been so well before.

Case 2. The second, a baby of nine months, head sweats, "box" cranium, rubbing off of the hair at the occiput, sensitiveness to being handled, dentition tardy. The perspiration and sensitiveness to being handled were relieved under calc. phos., but in the course of two months the baby died in an attack of capillary bronchitis.

Case 3. A child of eighteen months with a history of convulsions during the eruption of teeth; had gradually given up walking, crying with acute pain whenever the legs were touched, anæmic; loss of appetite, profuse head sweats, puny. After a month's trial on calcarea and silicea without the slightest improvement, the daily diet of oatmeal gruel and milk was increased by two teaspoonfuls of beef juice, a little lemonade and the juice of an orange. In a week's time there was a change for the better; at the end of a month the child was climbing up on his feet and improvement is still going on.

In the second and third cases the gums were swollen and purple, bleeding easily if rubbed. In the third case, the first sign of improvement was in the aspect of the gums. The hygienic surroundings of the first and second were good, of the third very poor.

Dr. HASELTINE: In my service at the Margaret Etter Creche and at the Workers' Creche, both of which are charitable institutions for the care of pauper children, I have naturally had much to do with rickets and the allied disorders. In these children, coming as they do from some of the poorest of the slum districts, we have ample opportunity to study the effects of antihygienic surroundings and we observe in them most every variety of trophic disorder. It has been a constant source of gratification, however, to observe how much may be done for these little patients by proper care as to diet and cleanliness, together with the use of carefully selected remedies. I believe that

rhachitis, when not due to a specific taint and when taken before the appearance of pronounced osseous manifestations, is decidedly a curable disease, and even in cases where the deformity is well marked I believe we can keep them out of the surgeon's hands by proper measures for checking the disease process. As the child grows and the osseous structures develop, a pronounced deformity will often disappear or become so slight as to obviate the necessity for surgical correction.

Another point which has been mentioned and to which I wish to add a word of emphasis, is that in many cases the mother's milk is inadequate for the proper nourishment of the child. The mothers as well as the children often suffer from a lack of proper food and in some such cases, although unable to submit the milk for chemical analysis, I have taken the child entirely away from the breast and placed it upon an artificial diet, with good results. In these institutions we are unable to avail ourselves of the excellent advantages offered by the various milk laboratories, but have resorted to the less expensive preparations from cow's milk, such as have been described in the paper read by Dr. Payne. I have done very little in the way of experimentation, having found that the treatment as ordinarily outlined by our homœopathic authorities, produces satisfactory results in almost every case.

Dr. C. E. Kahlke: As Dr. Cobb in his paper was mentioning the predisposing causes of the disease under discussion, there came to my mind the statement made by a prominent writer on the subject to the effect that rickets was almost never observed in a child or infant with a well defined tubercular history. The explanation was that a condition necessary for the development of rickets would only too readily admit of the development of a fatal tuberculosis.

Another point of interest in connection with the mortality of rickets, is that death may take place quite late in life as the result, indirectly, of the deformity produced in

early childhood. This is illustrated by a case with which I had more or less to do some time ago.

Case. The woman, aged about twenty-five years, was trying to give birth to a full-term child. Repeated attempts on the part of other physicians to apply the forceps were unavailing. Upon examination I found a very much contracted pelvis. Cæsarean section was performed. The post-mortem, three days later, revealed a bony conjugate measuring only $1\frac{8}{10}$ inches, the development of the pelvic counter arch having evidently been arrested. That the mother had had rickets was evidenced by her stunted stature, rickety rosary and spine.

As regards the medical treatment, one of the most prominent surgeons in America said not long ago, that "for rickets we have now a specific in small doses of phosphorus, the peculiarity being that large doses of the same drug will, in a healthy child, produce a condition practically the same as that found in rhachitis."

Dr. C. F. BARKER: We are led to suppose that the cause of rickets is to be found almost exclusively in faults of feeding and in bad hygiene. I have judged from one case at least, that we may place too much emphasis upon the defective supply of fresh air and bad or insufficient food as causes. Cases often occur in children of well-to-do families where the diet is general and the hygienic surroundings are the best. They need, most of all, the indicated remedy, and we never should forget that the poorly housed and the badly fed children need the indicated remedy too. In proof of this I will cite the following:

Case. A boy, two and one-half years of age, was attacked with rickets. He had a twin brother who remained robust. At birth these children weighed seven and one-half pounds each, and I could see no difference in their development up to the time the one referred to showed signs of the malady. They had been subject to no serious illness of any sort. Their diet was the same. The parents were well-to-do and lived in a modern house in the suburbs of the city, the house being separated from others, and standing in the middle of an elevated, sandy, six acre lot where the children spent much time out of doors. The father and mother were in good health and the children, it

seemed to me, had an exactly even chance, and had appeared to be strong and growthy.

The most forward one, or the one with the most sprightly disposition, was the one to become ill. The wrists and ankle joints enlarged and the legs bowed outward very badly. I ordered an increase of albuminous foods and a decrease of starchy elements and no sugar, though. as already stated, the diet had included everything essential to health, and in particular plenty of milk. The legs were rubbed briskly daily, especially along the outer aspect and pressed toward their proper axis, and the principal remedy given was calcarea phos. 3x. In six months the disease was arrested and the limbs straight, though when last seen by me at the age of seven, the boy who had rickets had not developed as rapidly as his brother. He was smaller but apparently growing well. I attributed the cure in this instance largely to the calcarea phosphorica.

Dr. Cornelia S. Stettler: It is an interesting fact which may throw some light on the dietetic treatment of rhachitis that the Japanese are exempt from it. Physicians who have had the opportunity to confirm this fact tell us that no case is recorded, and the explanation given is that the Japanese mothers' diet consists mainly of fats and oils, and that their children are nursed until the fifth or sixth year, with a supplementary diet after the first year of fish that are very rich in the hydrocarbons. This fact also furnishes a hint as to the therapeutic value of phosphorus, either alone or in combination with cod liver oil.

Dr. C. J. Swan: While I cannot add anything to what has been said in regard to the treatment of rhachitis, I will say a few words regarding the result of the convulsions that sometimes attend it and which have not been hitherto mentioned.

Case. I have a patient, a boy fourteen years old, who is practically blind in one eye from a peculiar sort of cataract, variously termed lamilar, zonular and perinuclear cataract. The cataract has undoubtedly come as a result of rhachitic convulsions, as indeed these convulsions are most frequently the cause of this form of cataract.

It is extremely rare for the lesion to be unilateral nearly always occurring in both eyes and the condition is not a common one in this country, but many cases are to be seen in the clinics of the old world when rhachitis is itself more common.

The opacity of the lens is not thought to be due to the disease itself, nor to the traumatism which the lens may suffer from being knocked about by the ciliary muscle during the spasms, but to the spasms of the coats of the vessels which supply the ciliary body and through that the lens with nutrition. In short the spasm causes impaired nutrition and the changes in the lens structure.

Strabismus is often said to date from attacks of convulsions of one kind or another, but I have never seen a case that had not some good reason for being, other than the convulsions.

Dr. G. F. Shears: The rickety child is brought to the surgeon for the correction of some deformity. I therefore rarely see cases of rhachitis in the early stages. Either the patient presents with a more or less progressive deformity, during what is known as the active stage when the periosteum is thickened and boggy, the superiosteal layer soft and vascular and the epiphyseal cartilage like a thickened cushion, or he comes after deformity is fixed and the process of petrifaction, or eburnation, has resulted in an excessive deposit of lime and an unnatural hardening of the bone tissue. The treatment necessarily varies according to the stage at which the patient comes under treatment. In the first stage operative treatment is contra-indicated; the disease is still active and even if deformity is rectified it promptly returns. During this stage knock-knee is treated by a brace, bow legs, expectantly or with braces, and spinal deformities, by massage and postural treatment. Unless the disease is quite general, light exercise is advisable. When ossification has taken place, and in children this does not occur until the fourth year, all mechanical treatment is not only cumbersome but useless. The conditions demanding operation which most frequently come to me

are bow legs, and knock-knee, although occasionally I have cases of bowed arms. In bow legs, where there is anterior curvature, I generally use the chisel to divide the bow; in lateral curvature I often employ osteoclasis. When the bowing is most pronounced near the joint osteotomy is preferable to osteoclasis because, while the bone unites readily and the union is firm, ruptured ligaments are slow to unite and the joints are often weak. For this reason in knock-knee I never resort to osteoclasis but use the chisel to divide the inner condyle, which is the point most at fault. In one interesting case of rickets which came under my charge there was not only bow legs but bowed arms. In this case I fractured both tibias and fibulas as well as both radiuses and ulnas at one sitting and put the child in plaster of Paris. A very satisfactory result was obtained.

XXIX. Ovarian surgery in osteomalacia. By Dr. R. Ludlam.—The study of the nature and treatment of rhachitis from so many clinical points of view tempts me to offer the following notes as my contribution thereto:

It does not appear to most of the members of this Society, perhaps, that the general subject is in any way related to surgical gynæcology. But, if rickets is the primitive or infantile form of the complaint, and the acquired form of osteomalacia occurs in the adult; if Oppenheimer is right when he claims that 91 per cent of cases of mollities ossium are found in women, and 70 per cent in pregnant women, there is a chance for a clinical inference. And if the medical treatment of the two forms of this disease is the same, as we find it stated by some of the best authorities, why should not ovarian surgery be brought to the rescue of a share of the cases occurring at and after puberty? Especially should the relation between the advent of this disease and the gravid state be borne in mind as suggesting that radical relief may possibly come at the hand of the gynæcologist.

Without going deeply into the subject, or treating of it exhaustively, I have gathered a few facts that are suggestive.

About ten years ago Fehling, of Bâle, called our attention to the relation between pregnancy and osteomalacia.*

*Compte rendu des séances de la Société Allemande de Gynécologie, 1888.

The disease being comparatively frequent in Bâle he had an unusual opportunity for the study of its various relations. At first he observed that the proportion of lime and phosphoric acid contained in the urine of these patients was diminished and not increased, as they are usually held to be. Then, having made Porro's operation in the case of a young woman who had been confined to her bed since her last labor five years before, and cured her completely of the osteomalacia, he made note of the fact. He afterward collected twelve cases in which but two cures of this disease had followed the Cæsarean section. In forty-four cases in which the Porro operation was made twenty women died from the operation, while in all of the twenty-four who survived it the peculiar bone pains soon left, and in less than three months all traces of the osteomalacia had disappeared. Of the seven Porro cases of Fehling all were entirely cured. Some of them, however, needed a cane in walking, because of a deformity of the lumbar spine. The usual percentage of mortality in osteomalacia is very grave, being from 74 to 84 per cent.

This experience led Fehling to conclude that the essential factor in the cure of this disease after Porro's operation, as distinguished from the failure after a successful Cæsarean section, was the removal of the ovaries in the one and not in the other; and so he tried the effect of castration with the best results. Of his first three cases, a woman who had been bed-ridden for a year walked with a cane in six weeks, and in six months was quite well; another woman, who had had eight children and who had not left her bed since her last labor, suffered so extremely with her back that it was impossible for her to rest, underwent a castration, the pains disappeared and in a month she could walk with a cane; and a third was as promptly relieved and cured. Fehling finally collected twenty cases of this kind in none of which was there a failure to get at least temporary relief. Oppenheimer did a Porro in a woman of forty-four for osteomalacia, with a complete recovery.

Hoffmeier reports the case of a virgin thirty years old who had severe pains in the pelvic bones, inability to walk and pelvic deformity, and who four weeks after the removal of the ovaries could walk without assistance, and the pains were much less severe. Ovariotomy has been highly recommended by Kahler, of Vienna, especially in recent cases with a narrowing of the pelvis; and Kurtz

and Schunta advised and report cures of mollities ossium by ovarian excision.

The following extract is brief and to the point:*

The nature of osteomalacia, as well as its real causes, are not yet absolutely known to us, and consequently its treatment is empirical. We do know, however, that this disease occurs most frequently in women, and that it is influenced by the functional activity of the genital organs; also that the majority of women suffering with osteomalacia are very apt to become pregnant, and that this affection usually begins or is aggravated by gestation or delivery. The conclusion has been reached that it is only necessary to castrate such a woman in order to check the development of this disease. This theory is wrong, for nullipara and virgins have sometimes been affected. Besides, we have seen women submit to the Cæsarean section who were promptly cured when the operation was followed by extirpation of the uterus and adnexæ, the cure not being effected if these organs were allowed to remain. From these facts we may conclude that the presence of the uterus and its appendages produce evil effects upon osteomalacia, and that their removal may result in a complete cure.

Fehling, of Bâle, was the first to try this surgical expedient, and under the most favorable conditions. In only removing the ovaries he proved within forty-eight hours afterward the disappearance of the intense pains in the pelvis and thorax. The explanation of these facts is very difficult, but, however, the proof is there, so that bilateral oöphorectomy may be considered as a very powerful curative agent in osteomalacia.

Fehling believed that the ovaries have a special nerve centre, which acts through the vaso-motor tract, on the process of assimilation and disassimilation of the skeleton, especially on that of the bony pelvis. However, other surgeons (Spæth) who left the ovaries and removed the uterus have had cures none the less remarkable. It might be possible that extirpation of the uterus, with preservation of the ovaries, would so modify the circulation in the latter that Fehling's nerve centre would no longer act, which would explain the cure of osteomalacia in Spæth's case.

We would also ask ourselves if the intense pains might not cease after oöphorectomy by suggestive influence; in

*La Revue médicale de la Suisse romande, 1892.

many cases it is perhaps possible. In Kummer's case we must doubt it. During eight years his patient received the most modern treatment of several distinguished physicians; in spite of this her disease became more and more painful, so that the latter months previous to the operation were passed in bed, and the severe pains were only momentarily relieved by morphine.

Whatever may be the interpretation of these theories, and whatever opinion one may form of this new operative measure, it is certain that this question should be studied and merits the attention of the medical world.

While it is true that, except among the lower foreign class of our population and the negroes in some sections, rhachitic women are scarce in this country, and cases of confirmed osteomalacia are still more rare, there are, I think, some practical lessons to be drawn from these facts. If we may suppose that a case of ordinary rickets is in any way complicated with puberty, whether by an extension of the disease or by its belated appearance, might not the prompt removal of the ovaries abort the affection and cure the patient, the same as in the osteomalacia of pregnancy? If the Cæsarean section and symphysiotomy are limited in their good effects to the mere emptying of the uterus without regard to the cure of the pelvic suffering and deformity, while either Porro's operation or the simple removal of the ovaries may possibly cure the whole morbid condition, why may we not sometimes choose the latter instead of the former?

VOLUNTEER PAPERS.—XXX. TREATMENT IN CASE OF URÆMIC POISONING. By DR. CHAS. S. MACK, of La Porte, Indiana.*—In casting about for a live subject for this paper, and remembering that no subject is a live one that does not afford opportunity for discussion, I have fixed upon *treatment in case of uræmic poisoning.* The particular question of which I would elicit a discussion is whether, in the present state of our knowledge of disease and of drugs, homœopathy *alone* promises the best results in the treatment of uræmic patients—or whether some other treatment *alone* is more

*Prepared for 1897 meeting of the Northern Indiana and Southern Michigan Homœopathic Medical Association.

promising—or, finally, whether a combination of homœopathic treatment and other measures affords these patients the best chance of recovery. It is only of treatment during acute attacks of uræmic poisoning that I would speak. I recall three instances, and only three, in which I have seen patients recover from acute symptoms of uræmic poisoning.

Case 1. One of these patients was a man brought to Chambers Street Hospital in New York, who had uræmic coma and uræmic convulsions. It is twelve years since this occurrence and details of the case have passed from my mind. I presume that the treatment was pilocarpine hypodermically and hot air baths; it is certain that homœopathy had no part in the treatment. The patient recovered from his convulsions and coma, though not, of course, from chronic nephritis. I think he had previously recovered from one or more such attacks.

Case 2. The second case I recall in which I have seen recovery from acute uræmic coma and convulsions was that of a woman who during her first pregnancy had œdema, labor lasted about seventeen hours. Delivery was by forceps. Child healthy. There was nothing unusual to report about the labor, but an hour after the child was born the mother became comatose and went into convulsions. Albumen was found in the urine. The convulsions recurred at short intervals for about twelve hours; they gradually became less frequent until they ceased. For a time the patient inhaled an anæsthetic during the convulsions; then she was kept for about forty-eight or sixty hours under the influence of chloral hydrate. At the end of that time there had been no convulsions for some hours. She was let to come from under the influence of chloral. Albumen entirely disappeared from urine within three or four days. Since then the patient has remained in perfect health, and has, without albuminuria or any cerebral or nephritic symptoms, passed safely through two pregnancies. She and all three of her children are in perfect health. The physician and his advisers who gave the chloral in this case were homœopaths; what, if any, homœopathic treatment was resorted to, I do not know; but certainly the dependence in treatment was placed upon large doses of chloral hydrate.

Case 3. It is within a few weeks that I have seen a third person recover from acute uræmic poisoning. The patient a few months ago miscarried while suffering from

albuminuria. The albuminuria persisted. She was out and about, but still under treatment when she experienced the attack which I am about to describe. She was half a mile from home shopping when seized with distressing dyspnœa. She was taken home in a carriage. Her physician was sent for, but could not be found. Then I was called, and responding, saw her for the first time. She lay upon the bed suffering greatly from dyspnœa. She was cyanotic and had œdema of the lungs. Her heart was so tumultuous in its action, that it was quite impossible to tell whether the valves were normal; the patient was perfectly conscious and remained so throughout the attack. Examining the urine I found it to contain a large amount of albumen. I kept the patient warmly covered and put hot bottles and hot plates around her. I gave her ⅛ gr. pilocarpine hypodermically, 1 dose of tincture of digitalis (about 6 minims) and ½ ounce doses of whiskey. I also gave her several doses of apis 3d decimal dilution. I thought she had made some improvement, though not very great, when at the end of an hour I left her in the hands of her own physician, who had arrived and had coöperated with me during the last part of my stay with her. She continued under his treatment, which doubtless was without regard for homœopathy, for he is not a homœopath. Later I learned from him that she had been kept in bed for some days, but had entirely recovered from the acute symptoms of uræmia.*

1. In cases of acute uræmic poisoning I have never practiced homœopathy *only*—unless I except one instance in which the patient died a very few minutes after I came to her—so soon, that I had hardly had time to do anything.

2. I have seen a great many patients die of acute uræmic poisoning when the treatment was entirely without regard for homœopathy.

3. I have here cited three patients who recovered from acute uræmic poisoning under treatment that was largely, if not exclusively, non-homœopathic.

The subject I should like to hear discussed is: treatment, homœopathic or other, in cases of acute uræmic poisoning.

*While calling this a case of uræmia I recognize that the symptoms may have been complicated by some heart trouble.

Editorial.

THE BICYCLE CONTENTION.—The attempt of some of our friends to unhorse the cyclists for medical reasons has not been altogether successful. For in this, as in other matters, the professional advice that we give is almost certain to be influenced by our own habits. The doctor who smokes, or who drinks coffee or whiskey, sees no harm in it for his patient; while if he is so very temperate as to be intemperate, he will deny all such luxuries to himself and to everybody else. So with the bicycle; the doctors who sport with the wheel themselves are not likely to be impartial witnesses concerning the good or ill effects of this form of exercise; while those of us who never ride the machine are in the awkward position of the teetotaler. Nor is the figure a forced one, for these two habits have run together for a long time. Witness the exclamation of one of Shakespeare's characters who was in trouble: "I would give all my fame for a pot of ale and my *safety*."

If only the men were inclined to this pastime the gynæcologist would not interpose any serious objection. They might ride to their heart's content, or discontent, and realize the doom of the beggar on horseback; but he must come to the rescue of the women. After all that has been said, and justly, too, of the benefit that many, perhaps most women who ride derive from the use of the bicycle, we should not forget that quite a share of them cannot indulge in coasting at all times and seasons without a risk of serious injury to their health. If the menstrual quarantine was worthy of a place in the old Mosaic law there is nothing to show that its claims have been abrogated by advancing civilization. Most women defy the rules, and take to the wheel with impunity, or perhaps with benefit; but, if they persist in the habit, regardless of "the month," a majority of them will certainly be injured sooner or later. The abuse of the instrument at such a time is the measure of its utility under proper conditions.

Whether it is not often harmful in cases of displacement, a boggy or subinvoluted uterus, relaxed ligaments, a badly torn cervix or perineum, or both, a pendulous abdomen with a large mesentery, or in chronic ulcerative or membranous colitis, is a very serious question. And since the women themselves do not always "think" of these conditions beforehand, perhaps they would not object to being sent to a commission of doctors whose duty it should be to certify that they were fit subjects for parade and service in the army of the wheelmen.

THE PROFESSIONAL HONEYMOON.—The departure of a young friend and colleague for a special course of study in Europe suggests the idea that whoever finds himself, after some years of general practice and of self-denial, ready to take such a trip is on the eve of his professional honeymoon. He quits his former life for a season, and sets sail on a sea of observation that will be new and attractive; makes a journey that will prove and develop his taste and his enjoyment; perfect his manhood; teach him how others live and work, and have their rights and their rewards; how to become skillful and unselfish; how to see the bright side of a busy life that has its compensations, if only we find them; and bring him a *dot*, or marriage portion, in the way of an experience that he could not otherwise obtain, and that he would not exchange for anything in the world.

The simile grows upon us when we reflect that the young man who marries prematurely, and knows little or nothing of human nature, easily makes the wrong choice of a companion, and may never settle down to the serious business of life in a sensible way. So the young doctor, just out of college, may make the blunder of not testing himself in a general practice before he marries a specialty to which he is not adapted and in which he never can succeed. One is foolish by exclusion, and the other by inclusion; and both would have done better to have deferred the honeymoon to a more convenient season.

There are bachelors in medicine who have boxed the compass of a routine practice, and who never will crave or enjoy the delights of a post-graduate honeymoon at home or abroad. But if they happen to live in Paris, or Berlin, or even in London, they miss it by not coming to Chicago; for "it is a bad rule that won't work both ways."

Hospital Notes.

THE SURGICAL CLINIC.

SERVICE OF PROF. HOWARD R. CHISLETT.

VARICOCELE; TUBERCULAR ARTHRITIS; FASCIAL TUBERCULOSIS; OPERATIONS; RECOVERY.—*Case 499.* Mr. J. L., aged twenty-three, American. This case is one of unusual interest, serving as an illustration of three surgical affections with as many operations. Eight months prior to admission the patient noticed an enlargement in the left scrotum. This slowly but gradually increased in size and was accompanied by pain which extended from the small of the back down the inside of the thigh. The general health has always been good. Two months ago, after a long ride on horseback, to which he was unaccustomed, he noticed an acute increase of this swelling and its extension into the perineal region. The swelling this time altogether was about the size of an orange. There was no additional pain attending this acute enlargement. The perineal portion of the swelling gradually absorbed and the examination at date of admission revealed in addition to typical varicocele, a firm, irregular enlargement about two inches in length and about three-quarters of an inch in width occupying the median portion of the perineum. The history of the case and present conditions being taken into consideration, I made the diagnosis of varicocele complicated by an unabsorbed hæmatoma, and advised operation.

Operation. Choosing the lower incision for the sake of investigating this perineal swelling, we did the regular operation of ligature and excision of one inch of the enlarged veins, suturing the divided ends together. The dissection was then continued until the median enlargement was exposed. It was found to be an organized exudate and was left alone hoping that it would absorb. The wound healed by first intention and the patient was discharged cured.

When this patient entered the hospital his arm was in splints because of a sprain of the wrist which he had received while playing ball. As the patient was referred to me simply for the varicocele, I did not examine his wrist until a few days before his discharge. At this time the following history was obtained:

Nine months ago his wrist began to pain him and he noticed some swelling over the back of the hand. He thought it acted like a sprain, although he was unaware of having hurt himself. The pain and swelling disappeared under local applications and rest. Three months later when playing ball, the wrist again began to pain him. His physicians put the arm in a splint and kept it so for three months. Examination at this time revealed the following conditions:

A wrist joint pronouncedly large and spindle-shaped, the muscles of the forearm being markedly atrophied, the extensors practically paralyzed. The swelling was most pronounced over the carpal bones, as was also the tenderness. There was no redness over the swelling and no pain except upon pressure or movement. The whole hand, however, appeared swollen and discolored, the discoloration being apparently from venous engorgement. There were no constitutional symptoms. Making a diagnosis of tuberculosis of the carpal bones, we applied a plaster cast in order to make the rest absolute. The patient reported every few days and at the end of three weeks the cast was removed. By this time the swelling had softened and fluctuation was distinct. As there were still no constitutional symptoms, the wrist was aspirated, about two drachms of tuberculous pus being removed and an equal quantity of sterilized iodoform emulsion injected. The arm was then placed upon an anterior splint. This treatment was continued for four weeks without improvement, so excision of the wrist joint was advised and accepted. The operation was performed through a radio-dorsal incision, all the carpal bones except the pisiform being removed. The end of the radius and the ends of the metacarpal bones being little diseased were simply curetted. A small counter opening was made on the ulnar surface, and the cavity drained by a few strands of sterilized silk worm. The dorsal wound was then closed in its entirety, a dry dressing applied and the arm put to rest on an anterior splint. The drain was removed in forty-eight hours, the wound healing throughout by first intention. The patient left the hospital at the end of four weeks feeling perfectly well and looking so.

He had not been gone long before reporting at my office complaining of a swelling in the perineal region. Upon examination this hard, nodular swelling which has been noted above, was found to have considerably enlarged

and from its lower portion to the anterior rectal wall was a prominent, fluctuating mass the size of a large goose egg. Considering the history of the case, the chronic nature of this swelling, I made a diagnosis of tuberculosis of the fascia and advised operation for its removal.

This operation was performed early in March, a long central incision being made extending from the middle part of the posterior reflection of the scrotum to the anal sphincter. The reflection of the flaps and evacuation of the purulent collection disclosed the typical granulations of tuberculosis. In brief, we were obliged to dissect off all of the fascia (perineal), both superficial and deep, exposing the urethra and the crura of the penis for a distance of three and one-half to four inches. Some portions of the fascia were in condition of caseation. The wound was then sterilized with pure iodine and carefully packed with iodoform gauze, no effort being made to suture the wound. The wound has filled in gradually and now, six weeks after the operation, is almost entirely healed. At no time has his temperature been above normal nor has he had any difficulty with urination.

ACUTE SUPPURATIVE PYELITIS; NEPHROTOMY; RECOVERY. *Case 472.*—Mr. J. W. F., aged twenty-three, American. Five weeks before entering the hospital, the patient had an acute pain in the lumbar region and also in the umbilical region. The pain in the back was continuous, much worse on the right side, and soon became located in the right renal region. He complained of a "dizzy" headache and a regurgitation of food immediately after eating. Has been gradually emaciating for the past four months. The patient had typhoid fever five years ago and an attack of gonorrhœa one year ago. A tall, slender man decidedly pale and a trifle jaundiced. A phyical examination was negative save for a pronounced tenderness over the right kidney. The urinary analysis furnished by Dr. Croftan, to whom we are indebted for the case, was as follows: Sp. gr. 1,028; color cloudy, brownish or reddish; reaction acid; albumin, both red and white blood cells, pus, oxalate of lime, blood casts and both pelvic and bladder epithelium. No tubercular bacilli. Temperature 100°, pulse 102.

Operation. The kidney was exposed through an oblique lumbar incision and the longitudinal incision made through the cortex into the pelvis. Owing to the free hæmorrhage we were obliged to pack the renal wound. An attempt to remove this packing was made in forty-eight hours, but the hæmorrhage was so extreme we were obliged to replace it. The second packing was finally removed on the fifth day after the operation. Its removal was followed by considerable discharge of pus and urine, but both gradually lessened, the wound healing completely, the patient leaving the hospital at the end of five weeks. At this time there was neither blood nor pus in the urine.

ACUTE INFECTIOUS OSTEOMYELITIS; EXCISION OF THE SHAFT OF THE TIBIA; RECOVERY.—*Case 468.* C. B., aged eight, American. Three months before admission this little fellow complained of pain just below the knee. Five days later it began to swell and in another day or two the swelling was lanced and about half a pint of pus evacuated. The wound has been discharging ever since that time. There was, of course, a great deal of pain and the attending symptoms, such as fever, rapid pulse, etc. The boy now seems languid, still suffers some pain, but has a good appetite and generally is well. The examination revealed a considerably enlarged tibia with a fistulous opening on the upper anterior surface. Through this opening necrotic bone could be easily felt.

Operation. An incision was made over the upper anterior surface, the fistulous opening into the bone sufficiently enlarged for thorough exploration. Careful examination through this opening revealed a complete disorganization of the original shaft and many foci of infection in the involucrum. It was therefore deemed advisable to make a subperiosteal resection of the entire shaft. This was accordingly done. The lower epiphyseal cartilage was perfectly healthy, but the upper one was found partly destroyed, the disease having extended through its centre and involved the end of the bone. The diseased part of the upper end of the tibia was removed with the sharp curette. The cavity was then fully packed with strips of iodoform gauze and the wound sutured except at its upper and lower angles. The limb was then suppported with lateral splints and the patient sent to bed.

The patient left the hospital with a small sinus in the uppermost angle. After the cavity of the tibia was filled

entirely with fibrous tissue, the child was fitted with a Thomas hip-splint and allowed to walk about. In a letter dated April 27, Dr. Ripley, to whom we are indebted for this case, reports the following condition: "The lower portion of the bone has partially filled in, but the upper portion is quite flat. With the brace he gets around very well, without it he cannot step on the limb, or at least bear much weight. His general health is fine and he is growing well."

This report is six months after the operation and partial destruction of the upper epiphysis has not appeared to impair the further development of the length of the bone; indeed, Dr. Ripley reports that "in its growth it seems to have kept even with the other leg."

TUBERCULAR ARTHRITIS OF THE KNEE; ARTHRECTOMY. SECONDARY AMPUTATION OF THIGH; RECOVERY.—*Case 465*; Mr. E. E. G., aged seventeen. American. About five months before admission this patient had an attack of gonorrhœa. One month later while riding a wheel he fell and hurt himself. Shortly after this, stitching pains began in his knee and in a little while the part became swollen. The condition was diagnosed gonorrhœal arthritis and had been treated on that basis until he fell into the hands of our friend, Dr. Frank Wieland, who kindly referred the case to our clinic. Upon examination we found a condition typical of tubercular arthritis, the white swelling, the heat, but no redness, the semi-fluctuation indicating a thickened capsule, the starting pains suggesting erosion of cartilage and the pronounced atrophy of the muscles above and below the articulation. The history of the case was so suggestive, however, that the true diagnosis was a matter of some doubt. It was, however, clearly an operative case, and the joint was exposed by means of a semi-lunar incision beneath the patella. This incision disclosed the characteristic features of primary synovial tuberculosis. We therefore determined upon an arthrectomy. There were one or two small foci of infection in the end of the femur which we thoroughly curretted and sterilized with iodine. The wound was then carefully sutured, drained by a few strands of silk-worm and placed to rest in splints. The wound healed kindly but several weeks after there was evidence of secondary involvement of the femur. The dis-

eased bone was chisled away by my friend, Dr. Kahlke, during my absence. Between two and three months after the first operation, the joint again began inflaming, soon resulting in pus formation and fistula. About this time the patient developed a cough and careful examination revealed some evidence of softening in the base of the right lung. He was carrying a little temperature and was becoming progressively anæmic. These constitutional symptoms together with the pulmonary involvement made it seem unwise to make any further attempt to save the limb, so amputation was advised and accepted. The amputation was performed by the long anterior, short posterior flap in the middle third of the thigh. There was a little suppuration in the flaps but the patient made a good recovery and after a month's stay in southern Michigan reported a gain of from fifteen to twenty pounds.

RUPTURE OF THE AXILLARY LYMPHATICS WITHOUT INJURY OF THE INTEGUMENT; ANTISEPTIC DRAINAGE; RECOVERY.—*Case 462.* Mr. N. O., aged forty-seven, American, laborer. This patient was thrown from a wagon several weeks before admission, falling, he states, upon the right shoulder. The wheel of the wagon struck him underneath the right arm. The part began to swell and in about twelve hours there was considerable enlargement in the right axilla. The skin over this swelling was badly ecchymosed, but intact. He suffered some pain at first but this soon passed away, leaving simply an enlargement which interfered with the arm movement.

Examination revealed a swelling the size of a fist in the right axilla. It was entirely free from evidence of inflammation, firm at the margins, but distinctly fluctuating over the greater part of its extent. It had shown no evidence of absorption in the six weeks since the accident. After a careful preparation an incision was made into the fluctuating portion and a large quantity of lymph withdrawn. The cavity was drained and dressed with all surgical precautions to prevent infection. There was a lymphorrhœa for several weeks, but ultimately the vessels became occluded, the wound healed, and there was complete resorption of the exudate. Inasmuch as there was no lymphœdema I take it for granted that the collateral lymph circulation was complete.

Miscellaneous Items.

The Twenty-first Annual Meeting of the Clinical Society will be held Saturday evening, May 29, in the Hahnemann College amphitheatre.——Prof. O. G. Tremaine has changed his residence from Chicago to Webster City, Iowa, and his old office, Room 31, Oakland Music Hall, is now occupied by Dr. F. H. Blackmarr.——Prof. Chislett has removed his residence to 3030 Michigan Avenue; Prof. Halbert ditto, to 4630 Greenwood Avenue; Dr. Louis A. Shultz ditto, to 6249 Monroe Avenue; Dr. W. Henry Wilson to 1425 Michigan Avenue, and Drs. C. G. Dwight from Chicago to 128 Wisconsin Street, Milwaukee; A. H. Hull from Webster City, Iowa, to Carthage, Mo.; C. W. Baird from St. Louis, to Beatrice, Neb.; Abbie Stewart to 3613 Indiana Avenue, city; J. H. Bowers from Wasica to Owatonna, Minn.; C. E. Ressler to 1762 Thirty-fifth Street, city; S. H. Aurand from Freeport, Ill., to 720 Washington Boulevard, city and Dr. J. Martin Clark to Oakland Music Hall.——*Apropos* of the last item Dr. Clark delivered a lecture on Anæsthesia to the graduating class of the Silver Cross Hospital at Joliet, April 17.——Prof. O. L. Smith has been appointed Associate Professor in the department of Diseases of the Nose and Throat, and sails for Europe for special study, May 12.——The Eleventh Annual Meeting of the Homœopathic Medical Society of Colorado occurs in Denver, May 25 and 26, at which Prof. Crawford will deliver a popular address; The Annual Meeting of the Homœopathic Medical Society of Wisconsin, to which everybody hereabouts is going, will be held in Milwaukee, May 26 to 28; the Illinois State Society met in Chicago, May 11 to 13.——Prof. C. Gurnee Fellows and his good wife will again sail for Europe, June 3, on the new Kaiser Friederich der Grosse, of the North German Lloyd line. *Bon voyage!*